UCRL-AR-119618 Rev 1

The Environment, Safety and Health Program at the Lawrence Livermore National Laboratory

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Published by the ES&H Working Group
Lawrence Livermore National Laboratory
June1996

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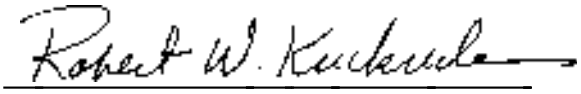
Foreword

This document provides an overview of the Laboratory's ES&H Program and a general description of how the laboratory manages its ES&H activities. It is designed to serve as a reference to Laboratory managers, supervisors, and other interested staff and visitors. Specific aspects of the Program and related technical details are treated separately in documents listed in the bibliography. The document was developed at the request of the Laboratory's Senior Management Council to bring together in one place a description of all aspects of the ES&H Program.

This document is to be reviewed annually and updated as necessary at the direction of the Deputy Director for Operations.



Robert Kuckuck
Deputy Director for Operations

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Section 1. Introduction

The Lawrence Livermore National Laboratory (LLNL) is a multi-disciplinary, multi-program research, engineering, and testing organization which is operated by the University of California for the Department of Energy. Its staff focuses its science and engineering research and management perspectives on national issues associated with security, energy, the environment, biomedicine, economic competitiveness, science and mathematics education, and responds to a special mandate with regard to nuclear weapons stockpile stewardship and treaty verification technologies. The Laboratory's dynamic multi-faceted mission has broadened in recent years to meet new national needs, among which are protection and restoration of the environment.

LLNL is committed to managing risk and complying with Environment, Safety, and Health (ES&H) regulations in the performance of its work. It expresses that commitment through its ES&H-related policies and procedures which are intended to protect the health and safety of employees and the public, and to prevent damage to property or the environment. Research and development frequently involves working at the limits of technical understanding and can generate unique risks. The challenge is to identify and manage those risks in an acceptable manner. LLNL believes that it is essential that all individuals engaged in research and engineering activities do so in a manner that proactively anticipates hazards, designs and implements effective controls, and complies with applicable ES&H regulations so that experiments are conducted in a timely manner, at a reasonable cost, and in compliance with health, safety, and environmental protection requirements.

The ES&H Program at LLNL is managed using a graded approach. The graded approach involves assessing hazards (the danger inherent in an activity), and then designing and implementing methods, processes, and procedures intended to control the risks, including residual risks (i.e., any risk remaining after appropriate controls have been implemented); in short, the greater the hazard, or risk, the more detailed the risk management process.

1.1. Purpose of the Document

The purpose of this document is to provide an overview of the Laboratory's ES&H Program and a general description of how the Laboratory manages its ES&H activities. The format and content of this document were designed to address the common needs of three audiences which it is primarily intended to serve: existing and newly appointed managers and supervisors, staff who have a need or desire for an overview of the total ES&H Program at LLNL, and visitors to the Laboratory.

This document is an overview only. Specific aspects of the Program and related technical details are treated separately and are to be found in documents variously cited in the text and the appendices, and listed in the bibliography.

1.2. Document Structure

This document is divided into seven sections. Following this section, an overview of the ES&H Program is given in Section 2, including the principal ES&H policies underpinning the Program, objectives which the Program intends to achieve, the implementation strategy, and a summary of the Program elements. The Laboratory organization and its ES&H management structure are described in Section 3. The roles of managers, employees, committees and other groups in executing the ES&H Program, and their responsibilities and authorities are reviewed in Section 4. In Section 5 the management processes used to identify, implement and evaluate compliance with ES&H requirements are described. Section 6 summarizes the existing ES&H documentation system, and a bibliography is provided in Section 7. A separate list of acronyms appears just after Section 7 and just before the five Appendices.

Section 2. Overview of the ES&H Program

The ES&H Program at LLNL is comprised of policies, procedures, institutional and program objectives, and defined implementation processes and strategies. A network of interlocking and mutually supporting subsidiary policies governing specific aspects of the ES&H Program such as those for Training, Waste Management, Decontamination and Decommissioning, Hazard and Risk Analysis, Laboratory Transfer, Conduct of Operations, Facility and Operational Safety Procedures, etc., exist at lower functional levels to provide finer-grained management guidance in the general day-to-day operations of the Laboratory. Consistent with accepted DOE practices, Laboratory policies are intended to be implemented using a graded approach. (See Appendix A for information on a graded approach.)

2.1. ES&H Program Policies

The ES&H aspects of all work conducted at LLNL are governed by a group of ES&H policies. The three principal policies are:

Health and Safety Policy

The health and safety (H&S) policy of LLNL is to take every reasonable precaution in the performance of its work to protect the health and safety of employees and the public and to prevent property damage. Furthermore, it is the policy of LLNL to implement U.S. Department of Energy (DOE) H&S orders and comply with prescribed standards and local, state, federal and University of California (UC) regulations in the area of health and safety.

Environmental Policy

The environmental policy of LLNL is to conduct operations in a manner which preserves the quality of the environment. We will comply with the letter and the spirit of governmental regulations and orders. Environmental risks will be reduced to levels as low as reasonably achievable (ALARA) below allowable limits. Interactions with the general public will be characterized by openness and integrity. We will foster effective internal oversight and external oversight. We will be accountable. Environment, health and safety will have top priority.

Environment, Safety and Health Compliance

The Laboratory will comply with local, state and federal ES&H laws and regulations. The authority to assure this compliance is delegated to the cognizant Associate Directors. Manuals will be developed by the Laboratory and provided to cognizant personnel within these organizations to aid in the discharge of their responsibilities. These manuals will provide guidance on how to achieve compliance with ES&H laws, orders, and regulations.

The Laboratory ES&H manuals will be kept up to date. At a minimum, the manuals will be updated annually. Manual revisions will be implemented through an augmentation of the safety procedure process with revisions being incorporated as the procedures are updated.

Laboratory personnel should seek guidance from the cognizant Assurance Manager(s), ES&H support and advisory organizations and from the

cognizant Associate Director if there is any question as to the compliance status and/or Laboratory-wide implications of their activities. ES&H support and advisory organizations will identify noncompliance issues and institutional concerns and bring these to the attention of management. If inaction or misplaced action is evident, it is the responsibility of Laboratory employees to notify the Director's Office through their Associate Director. These ES&H support organizations will develop guidance for review by the ES&H Working Group and approval by the Senior Management Council, and ensure that approved policy and guidance is communicated Laboratory-wide as appropriate.

Safe working environments require timely and thorough communication regarding risk and potentially hazardous conditions present in the workplace. Communicating new knowledge, technologies, processes, and procedures to Laboratory organizations would not be accomplished in a timely fashion if the Laboratory depended upon manuals as the only means of providing authoritative ES&H guidance for its activities. The ES&H Program at LLNL therefore relies heavily upon qualified discipline experts in the Hazards Control, Environmental Protection, and Health Services Departments to provide effective interim guidance until appropriate new or revised documentation can be generated and disseminated to Laboratory programs.

Other ES&H Policies

In addition to the three principal ES&H policies, the Director has approved the following institutional ES&H policies:

- Waste Minimization Policy
- Plant, Facility and Equipment Maintenance Policy
- Policy for Decontamination and Decommissioning of Facilities
- Training Policy for ES&H
- Quality Policy
- LLNL Metrology/Calibration Policy
- On-Site Traffic Safety Policy
- LLNL Policy on Public Participation in ES&H Issues
- Policy on Triennial Review of the ES&H Independent Review System

Except for direction-setting policies generated by the Director's Office, policies related to ES&H are developed under the guidance of the ES&H Working Group. Policies that have significant implications for the Laboratory are forwarded through the Deputy Director for Operations to the Senior Management Council for its ratification. The Deputy Director for Operations provides final approval. Policy statements are published in Laboratory ES&H manuals, as Administrative Memos in the Policy and Procedure category, as integral portions of program requirements statements, and in process and procedure documents such as the DefTrack Policies and Procedures Manual. Guidance for implementing policies is published in a variety of ways, the most typical of which is in Laboratory ES&H manuals and guidelines (see Section 6 for a summary of the ES&H Program documentation).

2.2. ES&H Program Objectives

In concert with established Laboratory ES&H policies, the ES&H Program objectives are intended to:

- Integrate ES&H requirements into all Laboratory operations and activities.
- Conduct operations in a safe and environmentally sound manner in order to protect human health, the environment, the public and to prevent adverse impacts thereon.
- Comply with applicable ES&H-related federal and state laws, local ordinances, and with contractually accepted DOE directives. (See Appendix C for an overview of the federal, state, and local laws and regulations and DOE directives with which the Laboratory is required to comply.)
- Establish public trust in the Laboratory's management of ES&H issues and concerns.
- Analyze ES&H risks associated with Laboratory operations, appropriately allocate risk reduction resources, and implement appropriate risk reduction procedures.

In accordance with the provisions in Article VI, Clause 6 of Contract W-7405-ENG-48 of October 1992, between the University of California and the Department of Energy, measures have been established to evaluate the Laboratory’s success in meeting these objectives.

2.3. ES&H Program Strategy

The Laboratory’s strategy for meeting these ES&H Program objectives is to establish and maintain:

- A clear definition of roles, responsibilities and authorities in ES&H matters in the line and functional organizations.
- A process for regularly evaluating and reporting management performance in meeting assigned ES&H responsibilities.
- An ES&H documentation system consisting of policies and requirements, guidelines and procedures, and records and reports to enable consistent Laboratory-wide implementation of the ES&H Program, and the documentation of its performance.
- An ES&H training program relevant to employee work assignments that emphasizes awareness of risks and the prevention of adverse impacts from Laboratory operations on human health and the environment.
- An operations planning process that appropriately considers environmental protection, hazards analyses, and risk assessments to identify and reduce or eliminate impacts from Laboratory operations on employees, the public, and the environment.
- An accident prevention program that integrates the goals of risk minimization and control of workplace hazards into the activities and work-planning procedures of Laboratory managers and employees.
- An environmental protection program that encourages innovative approaches to waste minimization and environmental pollution prevention, and to cleaning up contaminated sites.

- A multi-tiered internal review program, supplemented by independent external reviews, to assess the level of success in achieving compliance with ES&H requirements.
- A process for monitoring evolving ES&H standards, requirements, and procedures (see Section 5.1).
- A system to identify, track, manage, and resolve ES&H issues.
- A public outreach program to communicate with interested parties and encourage their participation in addressing Laboratory ES&H issues.

2.4. ES&H Program Elements

As illustrated in Table 2-1, the ES&H Program is comprised of four core programs, namely the Environmental Protection, Safety, Health Services and General ES&H Programs.

Environmental Protection	**Safety**	**Health Services**	**General ES&H Programs**
• Environmental Compliance	• Fire Protection	• Clinical Services	• Contractor Performance Measurement Program
• Environmental Restoration	• Criticality Safety	• Employee Assistance	• On Site Preparedness
• Environmental Monitoring	• Industrial Hygiene	• Training	• Hazardous Materials Packaging & Transportation Safety
• Waste Management	• Industrial Safety		• Conduct of Operations
• Waste Minimization & Pollution Awareness	• Nuclear Explosives Safety		• Self-Assessment
• Training	• Hazards Assessment & Safety Analysis		• Training
	• Radiation Safety		
	• Training		

Table 2-1. ES&H Main Programs and Program Elements

Each of these four main programs consists of several program elements. The program elements grouped under the "general ES&H Program" cut across the other three main programs; for example, the Training Program applies to job-related training including training in environmental protection, safety and health. Each element is intended to meet programmatic requirements and certain legal and/or contractual requirements, and may encompass specific objectives, functions and activities (see Appendix D for a description of each program element).

To execute each program element, the following steps are performed:

- Discipline experts in the ES&H support and advisory organizations evaluate external ES&H requirements and assist in developing guidance for implementing and complying with the requirements; new policies may be developed and implemented after approval by the ES&H Working Group, the

Deputy Director for Operations, or the Senior Management Council, as appropriate.

- Based on the guidance, employees in Laboratory line organizations integrate appropriate ES&H requirements into their programmatic operations and activities. Supervisors monitor the implementation actions. ES&H technical support and services are provided by the ES&H support organizations (Hazards Control, Environmental Protection, Health Services, Emergency Preparedness, and Office of Laboratory Counsel) primarily through the ES&H Teams (see Section 4.3)
- Each directorate conducts periodic self-assessment activities to ensure that effective management systems for ES&H implementation are in place, and to verify that ES&H requirements are appropriately implemented in their operations and facilities. As needed, ES&H workplace activities are modified to achieve compliance.
- Independent Laboratory and external oversight organizations evaluate the Laboratory's performance in meeting ES&H objectives and satisfying requirements. Where necessary, corrective actions are implemented.

The Laboratory has developed a management system to implement its ES&H Program elements, that comprises the following characteristics:

- It provides for a clear definition of roles, responsibilities and authorities for ES&H matters (see Section 4);
- It establishes formal and ad-hoc ES&H management processes in both line organizations and ES&H support organizations (see section 5); and
- It documents ES&H policies, requirements and guidance, and maintains records and reports of performance and assurance (see Section 6).

Section 3. Laboratory Organization

3.1. Introduction

LLNL is a government-owned contractor-operated (GOCO) research and development laboratory operated by the University of California (UC) under **Prime Contract W-7405-ENG 48** (Contract 48) with the U.S. Government as represented by the Department of Energy (DOE). Based on the terms and conditions of Contract 48, LLNL is also classified by the DOE as a Management and Operating (M&O) contractor. The President of the University has explicitly delegated to the Laboratory Director the authority to manage the Laboratory.

3.2. Director's Office

Figure 3-1 depicts LLNL's organization at the Director and Associate Directors' level. The Director is ultimately responsible for all activities at the Laboratory, including ES&H.

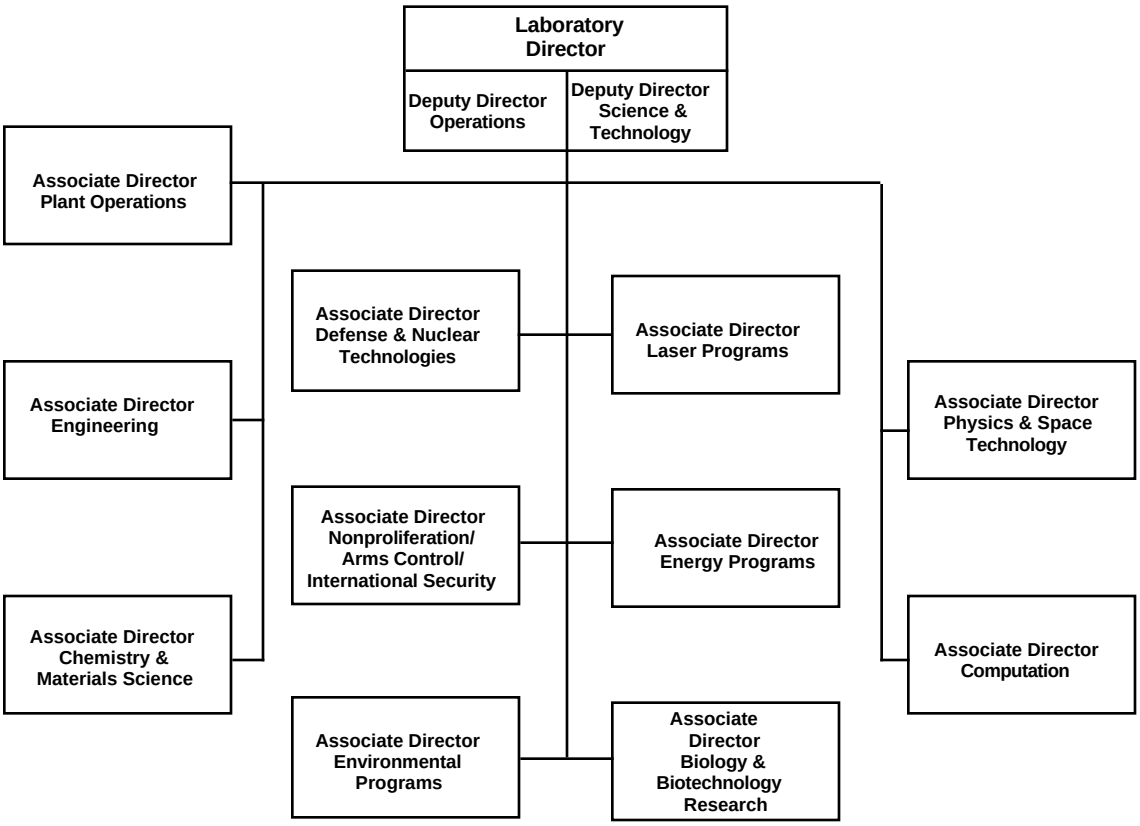

Figure 3-1. Senior Management Organization

To assist in the management of the Laboratory, the Director appoints and is supported by the Deputy Director for Science & Technology, the Deputy Director for Operations, and the Associate Directors.

3.3. Directorates

The Laboratory's scientific and technical programs and support activities are conducted by eleven directorates, each managed by an Associate Director.

The programmatic directorates are:

- Defense & Nuclear Technologies
- Energy Programs
- Laser Programs
- Environmental Programs
- Nonproliferation, Arms Control and International Security
- Biology and Biotechnology Research

The discipline-based research and development (R&D) directorates are:

- Engineering
- Physics and Space Technology
- Chemistry and Materials Science
- Computation

The Plant Operations Directorate provides ES&H and other technical support services to all directorates primarily through the Hazards Control, Environmental Protection, and Health Services Departments. Certain other administrative units such as the Controller, Procurement and Materiel Management, and Human Resources report directly to the Deputy Director for Operations.

3.4. ES&H Management Structure

The management and execution of the ES&H Program is a distributed task, i.e., each Laboratory line organization integrates applicable elements of the ES&H program in its work activities. Some administrative offices with significant ES&H-related responsibilities, e.g., the Office of the Laboratory Counsel and the Office of Contract Management, presently report to the Director's Office. Other organizational elements provide technical support and advisory, assurance and oversight functions. Figure 3-2 shows how LLNL is organized to manage the ES&H Program.

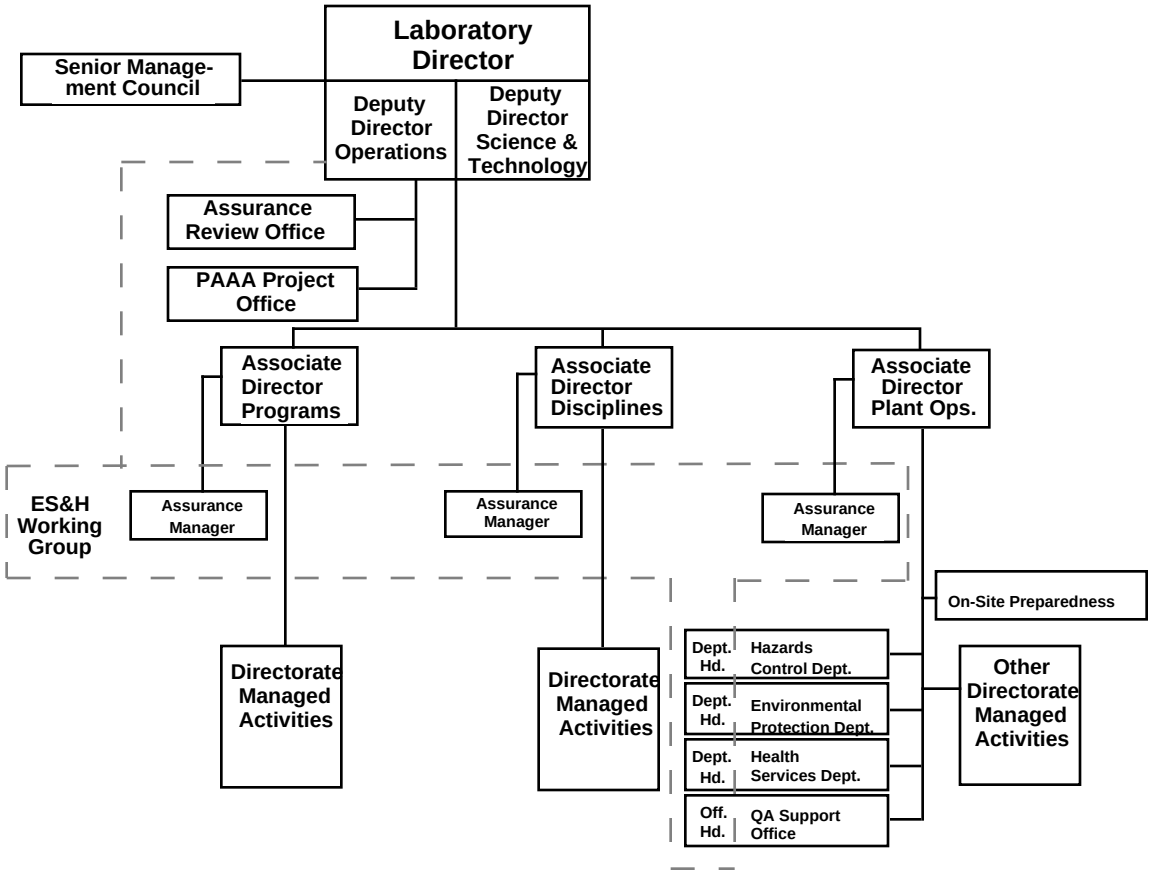

Figure 3-2. ES&H Management Structure

This figure illustrates that:

- Implementation of the ES&H Program is a line management responsibility that is delegated from the Director to the Associate Directors (ADs), and then flows through each AD's line/program/discipline management chain to each employee.
- The Deputy Director for Operations advises the Director on ES&H policies and institutional issues, with input from the ES&H Working Group and other ES&H committees, and oversees the effectiveness of activities and programs to implement these policies.
- ES&H institutional planning and technical support to the directorates are provided by the Associate Director for Plant Operations (AD/PO).
- Assurance of ES&H program implementation is performed at the directorate level by an assurance manager who, reporting to the AD, also provides limited independent oversight.
- Institutional independent oversight of the ES&H program implementation by the directorates is performed by the Assurance Review Office (ARO).

Specific roles, responsibilities and authorities assigned to line management, other organizational units and individuals mentioned above are provided in the next section of this document.

Section 4. Roles, Responsibilities, and Authorities for ES&H

4.1. Introduction

This section briefly describes line management and employee ES&H-related roles, responsibilities, and authorities. A more detailed description of these functions is provided in Appendix B. Appendix B also describes roles, responsibilities, and authorities of the following:

- ES&H Technical Support
- Groups and Committees with specific ES&H Responsibilities
- Individuals with specific ES&H Responsibilities

An unbroken chain of management responsibility and authority extends from the Director of the Laboratory through each Associate Director's organization. Four levels of responsibility and authority characterize this management chain, i.e., Executives, Senior Managers, Managers, and Supervisors.

The following table lists the position titles usually associated with the four management levels at the Laboratory. The roles, responsibilities and authorities of these management levels are summarized below.

Management Level	Position Titles
Executives	Director
	Deputy Director for Science & Technology
	Deputy Director for Operations
Senior Managers	Associate Director
	Principal Deputy Associate Director
Managers	Deputy Associate Director
	Department Head and Deputies
	Division Leader
	Program Leader
	Program Manager
	Facility Manager
	Operations Manager
Supervisors	Group Leader
	Section Leader
	Project Leader
	Lead Experimenter
	Supervisor

Table 4-1. Management Levels and Associated Position Titles

4.2. Executives

Director

The Director is the Laboratory's Chief Executive Officer. He is also an official of the University of California. As Chief Executive Officer, the Director manages and is accountable for all Laboratory operations and activities, including ES&H.

The Director's ES&H responsibilities include ensuring the implementation and overall effectiveness of the Laboratory's Environmental, Safety, and Health Program, that the Laboratory complies with applicable ES&H laws and regulations, and with Contract 48 requirements. He must also ensure that open communications on ES&H matters are maintained with the Laboratory's work force, the public and with external agencies. The Director's authority extends to approval of the startup and shutdown of programs; he may appoint senior managers and delegate responsibilities and authorities to them and to other LLNL employees. In addition, the Director is the final authority regarding the development and implementation of policies and procedures and the budget.

Deputy Director for Science and Technology

The Deputy Director for Science and Technology (DDS&T) is selected by the Director, confirmed by the Regents, and is a member of the Laboratory's executive management team. The DDS&T assists the Director in discharging the Director's responsibilities and acts in the Director's behalf when the Director is absent. The DDS&T has special interest in science and technology efforts.

Deputy Director for Operations

The Deputy Director for Operations (DDO) is selected by the Director, confirmed by the Regents, and is a member of the Laboratory's executive management team. He assists the Director by overseeing Laboratory-wide business, administrative and operational activities, including ES&H. The DDO serves as the principal instrument of quality-based management at the Laboratory and ensures the satisfactory achievement of performance measurement goals as specified in Appendix F of Contract 48. The DDO has the responsibility for providing an independent and institutional oversight function to assure the implementation of ES&H and quality requirements mandated by Laboratory policy. The DDO is assisted in his oversight function by the Assurance Review Office (ARO) and uses the Price-Anderson Amendments Act (PAAA) Project Manager to manage the Laboratory's response to nuclear safety rules and as the point-of-contact for interactions with the Defense Nuclear Facilities Safety Board (DNFSB).

Other significant functions include serving as liaison between the Senior Management Council and the ES&H Working Group and referring to the Senior Management Council and the Director those ES&H management issues that have broad impact or require the Director's decision or approval.

The authority of the DDO extends to representing the Director both internally and externally on matters related to Laboratory business, administration and operations, the

approval of institutional ES&H policies for the Director, and the approval of institutional business, administrative and operations plans. The Deputy Director for Operations also approves requests for exemptions and variances from mandatory codes, standards and DOE requirements.

4.3. Senior Managers

Associate Directors

The Director has delegated to the Associate Directors (ADs) the direct responsibility for conducting the Laboratory's programmatic work, and primary responsibility for implementing the Laboratory's ES&H policies in the performance of that work. In carrying out these responsibilities, each AD can simultaneously function in one or more of the following three roles: Program AD, Facility AD, and Payroll AD.

- The Program AD is responsible for carrying out program operations.
- The Facility AD is responsible for operating and maintaining the assigned facilities (buildings or areas).
- The Payroll AD is responsible for supplying the work force belonging to his or her payroll accounts to the program operations and/or to the facility operations and maintenance.

The Program AD

The Program AD ensures that Laboratory ES&H policies are integrated into their program's plans and activities, and that the program's operations and activities are conducted safely and comply with applicable ES&H requirements. The Program AD also ensures that the assigned Laboratory work force has the proper job-related training to carry out the work, that appropriate safety procedures are prepared and rigorously followed, and that training requirements are thoroughly documented. The Program AD will provide notice of program-specific training requirements to the Payroll AD.

The Facility AD

The Facility AD ensures that facility operations are conducted safely and comply with applicable Laboratory ES&H requirements. The Facility AD is to ensure the preparation and maintenance of required ES&H facility documentation, that facility-specific training requirements are identified and documented, and that notice of these requirements is provided to managers who use or provide services to the facility. The Facility AD must ensure that all personnel using or working in the facility have the facility-required training and that it is maintained current.

The Payroll AD

The Payroll AD ensures that personnel belonging to the AD's payroll accounts have the base skills appropriate to their job classification, are provided the training necessary to maintain these base skills, and have received institutionally-required training. The Payroll AD maintains records that confirm personnel belonging to his or her payroll accounts have the necessary base skills and meet all training requirements imposed by the institution, programs and facilities.

The AD for Plant Operations (PO)

The AD/PO reports administratively to the Director and programmatically to the DDO and is the Laboratory's senior manager for ES&H technical support.

The AD/PO provides and manages the necessary ES&H and QA expertise and technical support (guidance and services) to assist the other ADs and their line organizations in implementing the Laboratory's ES&H policies. The AD/PO designates the LLNL ES&H Functional Manager (ES&H/FM) for DOE directives and other Contract 48 compliance and performance issues related to ES&H, and develops and issues the institutional ES&H Management Plan and other institutional ES&H planning and budget documents. An important function is the preparation of annual budgets for overhead-funded institutional ES&H activities.

The AD/PO, through his ES&H and QA support resources, maintains an awareness of current DOE orders, regulatory requirements, codes, and standards and ensures that implementation guidance is issued. The AD/PO may also manage and/or coordinate the response to Laboratory-wide ES&H and QA appraisals, assessments, audits and inspections by DOE, the University and other agencies, and may track corrective actions. In general, the ARO provides the Laboratory's central point of contact for appraisals by the University and the DOE, and the PAAA Project Manager for the DNFSB.

All ADs

As part of their general responsibilities and authorities, all ADs delegate ES&H responsibility and authority to managers in their line organizations; however, the AD remains accountable to the Director for ES&H performance and assurance. ES&H-related authority and responsibilities include the appointment of an Assurance Manager to oversee ES&H activities within the directorate, and approval of budgets and expenditures for programmatic or functional activities, including funding of ES&H-related activities.

ADs approve directorate-level ES&H plans and procedures, Occurrence Reports, and other ES&H documents requiring an AD signature. It is the AD’s responsibility to coordinate responses to ES&H-related incidents and to generate the appropriate notifications and reports required by Laboratory ES&H policies. ADs also review and concur with requests for exemptions and variances from mandatory codes and standards, authorize the startup and shutdown of operations in assigned facilities, and authorize disciplinary actions of employees who willfully ignore or fail to comply with Laboratory ES&H rules and requirements (see the LLNL Personnel Policies and Procedures Manual, Section E.II).

In addition to the general responsibilities listed above, other responsibilities are assigned to all ADs. For example, all ADs are to be aware of legal, regulatory, and contractual ES&H requirements applicable to their operations and facilities; and they are required to establish a management system consisting of plans and procedures that provide for and ensure the implementation of Laboratory ES&H polices and requirements in their directorate’s line organization and assigned facilities.

As a member of the Senior Management Council, ADs review and endorse significant ES&H policies which have institutional impact and forward them to the Director for approval. They also ensure that an operations self-assessment program is conducted in their assigned facilities to verify that the ES&H program is effectively implemented.

4.4. Managers

In the context of ES&H, managers are employees who plan, organize, direct, and manage work and/or personnel in their programmatic, facility, or functional area of responsibility. Depending upon job function, manager's responsibilities include knowing the applicable ES&H laws, regulations and Laboratory policy requirements and ensuring that they are being complied with in their area of responsibility. They must know and understand applicable ES&H responsibilities, their own as well as those distributed to interfacing organizations. Managers must plan new operations with consideration for the potential effects on the environment, and minimize waste generation, environmental discharges, and safety risks during all activities. They are to design and conduct operations to assure that employee exposure to risk conforms to the ALARA objectives, and that employee exposure to hazardous and radioactive materials does not exceed regulatory limits.

General requirements include ensuring that each employee's job description reflects work requirements and duties, each employee is trained and qualified for the work assignment, and is fit for duty. In addition, records must be maintained that document training and certification requirements, and the dates when training or retraining was completed for each employee. Other significant ES&H-related activities may include:

- Implementing a self-assessment program in accordance with directorate plans and procedures, and seeing that necessary corrective actions are carried out.
- Ensuring that self-help plans and emergency response procedures are prepared for operations and facilities assigned to the manager, and that they are current and the personnel staffing specific roles are appropriately trained.
- Notifying the cognizant senior manager of occurrences and incidents in accordance with Laboratory notification and reporting requirements.
- Reviewing accident and incident reports and reportable occurrences and taking appropriate action to correct the situation and prevent its reoccurrence.
- Immediately stopping operations in a safe manner upon discovery of an imminent danger situation, and ensuring that the situation is promptly mitigated and all required reporting is completed in compliance with Laboratory policy.

Managers are authorized to delegate authority appropriate to the responsibilities assigned to lower level line managers and staff. This authority may include allocation of resources to establish safety and environmental protection programs, obtaining technical support and assistance from ES&H functional organizations, and correction of deficiencies and non-compliant conditions and situations.

4.5. Supervisors

Supervisors directly assign, control, monitor, and evaluate the day-to-day work activities of employees, contract personnel and visitors assigned to their organizational unit. Depending upon job function, they are responsible for informing employees, contract personnel, and visitors of all health and safety hazards in the workplace, and instructing them on how to protect themselves from those hazards. Supervisors provide employees with Material Safety Data Sheets (MSDS) and other health and safety information and ensure that employees are provided with the correct protective equipment and clothing, and are trained in its use.

Supervisors are to ensure that required access controls, signs, alarms and warning devices are installed and functioning, and to ensure that employees are appropriately trained to carry out their job duties which includes knowing and understanding the potential ES&H impacts of their work and their responsibility to conduct their work in a safe manner. Supervisors also arrange for and obtain medical clearances for employees working with specific health hazards.

Other supervisory responsibilities include taking actions to minimize the generation of waste and enforcement of policies and procedures governing Laboratory waste handling practices, environment-related operating permits, and pollution prevention. Supervisors monitor operations and activities regularly and mitigate any ES&H-related problem using the principles of graded approach.

4.6. Employees

Every employee at LLNL is required to know and understand the ES&H requirements of his or her assignment, and the potential hazards in the work area. He or she must participate in all required ES&H training and health monitoring programs. All work assignments must be performed in full compliance with applicable ES&H requirements as published in Laboratory manuals, guidelines, and established in safety procedures.

In addition, each employee is required to correct an ES&H-related problem immediately or inform the supervisor of the problem if it exceeds the employee's resources, competence, or authorization level. In addition to informing his or her immediate supervisor, each employee must warn fellow employees and visitors of known hazards including defective equipment. Every employee must know emergency plans and procedures for his or her work areas. Employees are authorized to stop work within their area of responsibility when others are observed performing an operation that is perceived to be imminently dangerous.

4.7. Other Organizations, Groups and Individuals

The organizations, groups, and individuals who have important roles, responsibilities and authorities in meeting the Laboratory's ES&H policies are listed in Table 4-2. Detailed descriptions of the roles, responsibilities and authorities are contained in Appendix B, in the section specified within the parenthesis in the listing.

ES&H Technical Support (B.6)	**Groups with Specific ES&H Responsibilities (B.7)**	**Individuals with Specific ES&H Responsibilities (B.8)**
• ES&H Support Organizations (B.6.1)	• Senior Management Council (B.7.1)	• Assurance Managers (B.8.1)
• ES&H Teams (B.6.2)	• ES&H Working Group (B.7.2)	• Training Manager (B.8.2)
	• Assurance Review Office (B.7.3)	• Training Contacts (B.8.3)
	• PAAA Project Office (B.7.4)	• Laboratory Emergency Duty Officer (B.8.4)
	• Office of Laboratory Counsel (B.7.5)	
	• Office of Contract Management (B.7.6)	• ES&H Functional Managers (B.8.5)
	• Training Program Committee (B.7.7)	
	• Institutional ES&H Committees (B.7.8)	

Table 4-2. Organizations, Groups and Individuals Important to ES&H

Section 5. ES&H Program Management Processes

This section describes six management processes used by the Laboratory to manage the ES&H Program:

- Establishing applicable ES&H requirements,
- Developing programs and documentation,
- Implementing requirements,
- Evaluating implementation,
- Improving ES&H performance, and
- Budgeting for ES&H activities.

5.1. Establishing Applicable ES&H Requirements

The process for establishing the ES&H requirements applicable to the Laboratory involves two key steps:

- Being aware of current as well as new and changing regulations, DOE requirements, and University of California policies; and
- Interpreting external requirements and evaluating them for applicability and impact on Laboratory operations.

Awareness of External Requirements

Laboratory ES&H requirements are derived from numerous sources, but primarily from federal, State of California, regional, and local statutes, regulations and ordinances, DOE directives, and University of California policies. (For an overview of the regulatory and contractual environment, see Appendix C.) These regulatory and contractual requirements[1] are dynamic and cross many technical disciplines. The Laboratory relies primarily on the professional staff in its institutionally managed ES&H support organizations, the Office of Contract Management, and the Office of the Laboratory Counsel to maintain its awareness of new and changing regulations and DOE directives. The Laboratory interacts with regulatory agencies, UC, and DOE staff through meetings and site visits. The Laboratory also makes heavy use of modern communications systems as part of its information resources. When requested, Laboratory ES&H experts and programmatic personnel review and comment on proposed revisions to existing DOE directives, new directives and proposed rules.

[1] The regulatory and contractual requirements are also referred to in this document as compliance requirements.

Evaluation of Requirements

Management of the appropriate ES&H support organization[2] assigns departmental staff to review, interpret and analyze proposed and final regulations, rules and DOE directives. This review assesses whether the potential requirements specifically apply to the Laboratory, and if so, whether compliance actions will have to be implemented site-wide or will be limited to only one or a few organizations and when they become effective. The potential impacts on Laboratory operations are also evaluated; e.g., the need for additional training, record keeping, reporting, new instrumentation systems, and modifications of existing structures and operations.

The next step usually involves a review of the analysis of new requirements and impacts by the ES&H Working Group, particularly when site-wide implementation of requirements is indicated and significant costs are associated with compliance. The program organizations represented in the ES&H Working Group provide feedback to the ES&H experts on programmatic and cost impacts, and the practicability of proposed implementation actions.

5.2. Developing Programs and Documentation

Program Development

A new regulation or DOE directive often requires the Laboratory to implement new requirements; the Conduct of Operations Program and the Waste Minimization and Pollution Prevention Awareness Program are two typical examples. New programs may also need to be developed and implemented to meet the ES&H performance measures established under Article VI, Clause 6 of Contract 48.

An institutional implementation or compliance plan may be required which lists specific actions and milestones for implementing the new requirements. In other cases, guidance is developed as part of general guidance for Laboratory-wide distribution. The recommended actions may include such features as the development of implementation guidance and procedures, the acquisition of special equipment, the inspection and modification of buildings and utility systems, or the determination of special communications and training requirements. In addition, for some sets of requirements, performance criteria may be established in order to evaluate the effectiveness of implementation. ES&H experts develop the required programs, plans, and guidance with

[2] Some ES&H-related DOE orders , e.g., those governing nuclear explosives and emergency planning activities, are reviewed by the cognizant program organizations.

input from the program organizations. Institutional implementation guidance is reviewed by the ES&H Working Group and sent to the SMC or the DDO for endorsement when required.

Documentation Development

Laboratory ES&H documents are developed and revised to aid line management in integrating requirements into the Laboratory's work activities. The normal document generation, review, and approval process is depicted in Figure 5-1 on the following page. From the set of external requirements the ES&H discipline experts incorporate the applicable requirements, along with implementation guidance, into Laboratory ES&H Manuals and Guidelines (see Section 6.1). The ES&H Working Group reviews and approves all new/revised Laboratory ES&H Manuals, including Supplements and Guidelines which are then signed by the DDO.

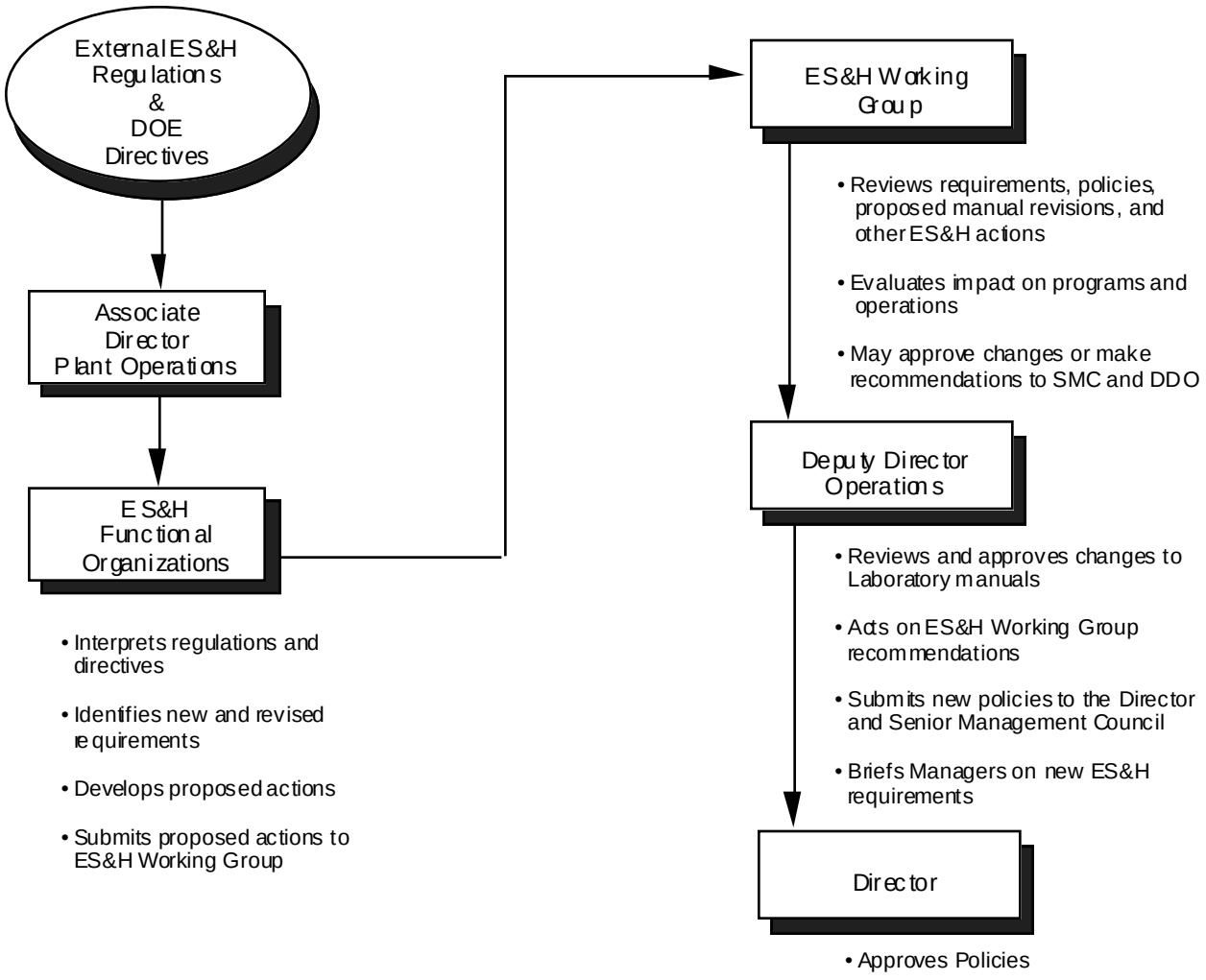

Figure 5-1. Document Process

Changes to existing ES&H policies and procedures or the generation of new ES&H policies may be proposed by a program, the ES&H staff, the ES&H Working Group, or the Senior Management Council. New policies or major changes to existing policies and procedures may be approved by the ES&H Working Group or, in cases of potentially significant institutional impact, elevated to the SMC for endorsement and to the Director's Office for approval.

5.3. Implementing Requirements

The implementation of Laboratory ES&H policies and requirements is a line management responsibility. The ES&H responsibilities for line management, from the Director through the line management chain to the employee, have been clearly defined (see Section 4 and Appendix B) so that everyone in this management chain understands his/her part in implementing the Laboratory's ES&H policies and requirements. The formality and level of conformance with Laboratory requirements are guided by the graded approach as described in Appendix A, and depend on the general nature of the work activities (i.e., administrative activities, experimental work), and their respective risks and hazards. Directorate plans and procedures are developed and govern the directorate's operations and activities.

The general process for integrating ES&H requirements into work activities is depicted in figure 5-2 below. The process involves the following steps:

- Work Planning,
- Work Preparation and Authorization, and
- Work Monitoring.

The requirements and formal process steps are described in Chapter 2 of the Laboratory's *Health and Safety Manual*, and therefore are only summarized in the following discussion.

Work Planning

During the planning phase of a project, experiment, test or any other work activity, the hazards, environmental concerns and potential ES&H compliance requirements are evaluated. This evaluation is performed by the person in charge of the activity using written guidance from the Laboratory ES&H Manuals, and with advice from ES&H experts. The ES&H evaluation is documented and approved by the cognizant line manager. This process step identifies ES&H-related issues and actions that need to be addressed before the work activity can proceed. See Chapter 2 of the *Health and Safety Manual* for more details.

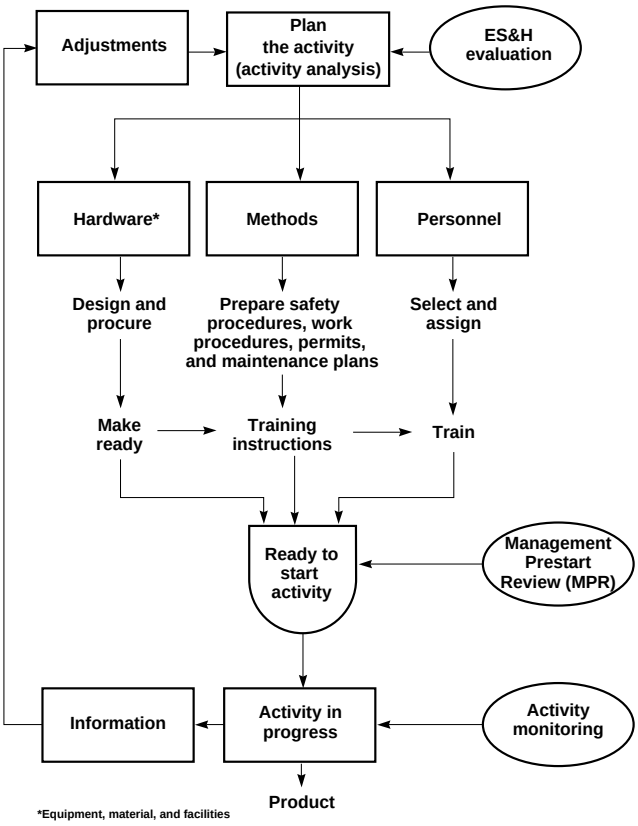

Figure 5-2. Work planning and execution process. The oval areas highlight ES&H evaluations that take place in the cycle.

Work Preparation

Based on the ES&H evaluation, environmental and safety documents (e.g. environmental permits, NEPA documentation, Preliminary Hazards Analysis) are prepared, as required, and submitted for approval to regulators, DOE or Laboratory management. When mandated by the Laboratory ES&H Manuals, safety, operating, and maintenance procedures are developed, reviewed, and approved by line management. Personnel receive required ES&H training, including training to understand the health hazards associated with the activity. Other ES&H compliance requirements (e.g., hazardous waste management requirements) are identified and appropriate actions are planned for meeting them. Depending on the hazards and risks involved in the work activity, a readiness review is conducted by line management, or—in some special situations—by DOE. This latter step assures DOE line management that all applicable ES&H requirements have been considered and addressed before the start-up of work is authorized.

Work Monitoring

While work is in progress, supervisors monitor the activity for adherence to established procedures, safe practices and changes in operations that may impact safety or the level of environmental protection. The ES&H Team also monitors the work environment and informs management of unsafe situations and noncompliances with established ES&H requirements. In addition, the ES&H Team advises management of new applicable standards and regulations, or new interpretations of existing rules by regulators that may impact the activity. Changes in operations and ES&H requirements are evaluated and appropriate adjustments made.

5.4. Evaluating Implementation

Laboratory operations and management performance are periodically evaluated for compliance with ES&H requirements. Evaluations are performed using:

- Directorate ES&H self-assessments,
- Reviews and appraisals by Laboratory and external oversight entities, and
- Management Performance Self-Assessments.

Tools have also been developed to aid in tracking the results of these evaluations; the primary tool for ES&H-related information is the Deficiency Tracking System (DefTrack).

Directorate ES&H Self-Assessments

Requirements in the *Health and Safety Manual*, Supplement 2.04, (ES&H Self-Assessment Program), mandate that each directorate conduct periodic self-assessments based on a written implementation plan. All organizational elements, facilities, operations and support infrastructures, including safety systems, are assessed at intervals using the graded approach. Self-assessments may include, but are not limited to, facility management or supervisory review of work areas and operations, directorate reviews of training plans and training completion records, and compliance inspections by organizational safety committees and ES&H experts from the ES&H support organizations. Deficiencies found during self-assessment activities are recorded and tracked with the Deficiency Tracking System, described below, until they are corrected. A final report for each assessment or assessment period is prepared for the cognizant Associate Director.

Reviews and Appraisals by Laboratory and External Oversight Entities

The Director established the Assurance Review Office (ARO) to conduct independent reviews and appraisals of each directorate's ES&H-related activities. This function is described in Appendix B Section B.7.3. Every three years the Director's Office conducts a *Triennial Review* of the ES&H internal review system; i.e., the self-assessment

program. Other appraisals may address the implementation of specific Laboratory programs such as Conduct of Operations, compliance with environmental rules and training program requirements, etc. All appraisals and reviews are documented. Corrective actions are tracked on the DefTrack System until close-out.

In addition to the internal evaluations, UC, DOE and regulatory agencies conduct inspections, reviews and appraisals as part of their ES&H oversight functions (see Appendix E for a discussion of oversight activities). Whenever possible, regulatory deficiencies are corrected immediately, while the correction of other deficiencies and findings are managed using the graded approach.

Management Performance Self-Assessment

Under the provisions of Appendix F, Contract 48, the Laboratory conducts an annual self-assessment to evaluate its management performance in several administrative and operational areas, including ES&H. This self-assessment is made against a set of criteria called Performance Measures (PMs). The PMs are developed by representatives from LLNL, LBL, LANL, UC, and the DOE. The actual self-assessment of the Laboratory is an on-going process conducted by LLNL personnel. In FY 1994 - 5 this self-assessment covered 22 ES&H performance measures.

Where necessary, corrective action plans are developed to address any significant ES&H management deficiencies that the self-assessment may disclose. The self-assessments and corrective action plans are validated by independent evaluation teams, reviewed by the SMC and then submitted through the Office of Contract Management to UC/DOE. Corrective actions are tracked on the DefTrack System.

In addition to the Triennial Review and the PM self-assessment process, the Oakland Operations Office of the DOE (DOE/OAK) conducts separate management performance appraisals of the Laboratory which include several ES&H areas.

Deficiency Tracking System (DefTrack)

The Deficiency Tracking system was established by LLNL to track the status of ES&H deficiencies from the time they are identified until they are resolved. The database management system is administered by the Assurance Review Office (ARO) and is described in *Deficiency Tracking System, Policy and Procedure Manual*. Many specific areas and several hundred items of particular interest to the Laboratory were identified and assigned a “compliance code.” A set of severity criteria, calibrated to OSHA or other relevant requirements, were developed to complement the compliance codes in order to

gather information not only on the types of ES&H issues that occur at the Laboratory, but to determine their severity as well.

The compliance codes are listed in "families" related by their general category; for example, under environmental issues are Air Quality, NEPA, PCB, Water Quality, etc., and under the general heading of health and safety related issues would be such areas as Alarm Systems, Posting and Labeling, Safety Limits, Emergency Preparedness, Fire Prevention, and Respiratory Protection. The latest version of the DefTrack database contains 318 specific compliance codes. Generic codes are also contained in DefTrack to accommodate findings that are not included as specific compliance codes. The fine-grain of the compliance code structure enables the development of an effective "trending" process that materially contributes to the development and implementation of effective problem solution strategies.

Each directorate maintains its own DefTrack database and periodically *rolls-up*, i.e., transfers, certain categories of deficiencies to the official LLNL DefTrack database which is maintained by the ARO. Schedules and criteria for roll-ups are established by the ES&H Working Group and the process is managed by the Assurance Review Office. In addition, the ARO provides trending reports to individual directorates and develops an *institutional* summary report annually.

5.5. Improving ES&H Performance

Systems used by management for improving ES&H performance at the Laboratory include a Corrective Action Process and a Lessons Learned Program.

Corrective Action Process

The deficiencies identified in operations and facilities during self-assessments and during audits, reviews and appraisals by Laboratory and external oversight entities are reviewed to determine appropriate corrective actions. The objective of this process is to improve safety in the workplace and compliance with ES&H requirements. Line management assigns responsibility for implementing actions to correct self-assessment deficiencies and uses the DefTrack System to monitor the status until the actions are completed and verified. Findings and recommendations from appraisals, audits and reviews of operations are documented in reports and put into the DefTrack system where appropriate. In response to the findings and recommendations, management develops action plans to correct the identified operational and management problems. The plans include schedules for completing the corrective actions and provide for regular reporting to the agency or office that conducted the appraisal until all deficiencies are closed-out.

A corrective action process is also implemented by management in response to findings and judgment of needs identified in incident analysis reports. For a description of the incident analysis process and follow-up requirements see Supplement 4.08 of the *Health and Safety Manual*. Corrective action plans may also be developed as a result of the analysis of immediate, contributing and root causes of DOE-reportable occurrences (see Appendix D.5.2.3 Occurrence Reporting program). The primary objective in formally reviewing incidents, accidents and other occurrences is to prevent the recurrence of the event and to reduce risk in a specific operation or facility.

Lessons Learned Program

Improving ES&H performance in all Laboratory organizations relies to a large extent on communicating and applying the lessons learned from operational incidents, near misses, actual occurrences and deficiencies identified during assessments, reviews and appraisals.Laboratory management employs a variety of means for communicating lessons learned. These include:

- Distribution of some incident analysis reports and occurrence reports to managers responsible for similar operations or facilities,
- Organizational safety meetings,
- Laboratory-wide distribution of publications such as Safety Wise, Environmental Alert, Engineering Safety and Engineering Safety Alerts,
- Communication of ES&H issues and lessons learned at meetings of the ES&H Working Group and Laboratory managers (400 Meeting),
- Trending of data from industrial safety incidents, electric shocks and radiation exposure and communicating the findings to Laboratory management, and
- Trending of data from the DefTrack System and the Occurrence Reporting and Processing System and informing management of the findings.

In addition, the Laboratory has recently instituted a more formal, management-centered Lessons Learned program. This program was instituted to meet a 1994 performance measure under Contract 48, Appendix F. The goal of this effort is to provide managers and employees with timely information for improving operational safety and attaining compliance. The expanded program is conducted by the Hazards Control Department. Information on operating experience is gathered both from inside and outside the Laboratory from various sources. Relevant items are communicated primarily via electronic mail, but also as hard copies using a standardized format. The manager of the Lessons Learned program maintains a database about the distributed items. Where specific actions are required, a brief summary of the action by each directorate is recorded.

5.6. Budgeting for ES&H Activities

This section briefly describes the annual budget process and the long-range planning for conducting ES&H activities.

Annual Budget Process

Annually, overhead budget requests are prepared by cognizant Associate Directors for institutional ES&H activities such as the functions and operations of the Hazards Control (HC), Environmental Protection (EP) and Health Services (HS) Departments. Proposed budgets include requests to fund the core activities (maintenance of existing capabilities) in the departments and compliance-related items; e.g., implementation of Contract 48 Performance Measures, new DOE directives and environmental regulations. Items in the budget requests from the HC, EP and HS Departments are prioritized with the aid of a risk-benefit/cost analysis tool. Budget requests for supporting institutional ES&H activities are submitted to the Laboratory's Budget Office and become part of the total overhead budget request. In addition to ES&H-related costs, the overhead budget category includes the costs for all institutionally managed (indirect) functions, e.g., safeguards and security, business operations, human resources, etc. Costs for indirectly-funded ES&H activities are paid through overhead (a "tax") on the direct programmatic funding.

In addition to the institutional costs for ES&H activities, ES&H costs are also incurred by Laboratory programs (direct costs). The budgets prepared by the Associate Directors for their program activities include some core ES&H and compliance-related items. However, most ES&H-related costs, e.g., the preparation of safety procedures, training of personnel, self-assessment activities, etc., are considered part of the normal programmatic activities and are not budgeted or tracked separately from the program costs.

Long-Range Planning

At the request of DOE, the Laboratory prepares and annually updates the *ES&H Management Plan.* This five-year planning document covers projected activities (tasks), milestones and costs associated with reducing risk, achieving compliance with ES&H requirements, and fulfilling compliance activities. The document includes budget forecasts for core activities, planned compliance and unfunded compliance/improvement items in the indirect and direct (i.e., program-funded) budget categories.

Section 6. Program Documentation

This section provides an overview of the Laboratory's ES&H documentation system (see Figure 6-1). Requirement or input documents are the Laboratory ES&H manuals and guidelines, standards, plans and procedures that define ES&H policies, establish requirements and provide implementation guidance. Performance or output documents include various ES&H-related records and reports. A description of these documents is provided in *ES&H Documentation at LLNL*.

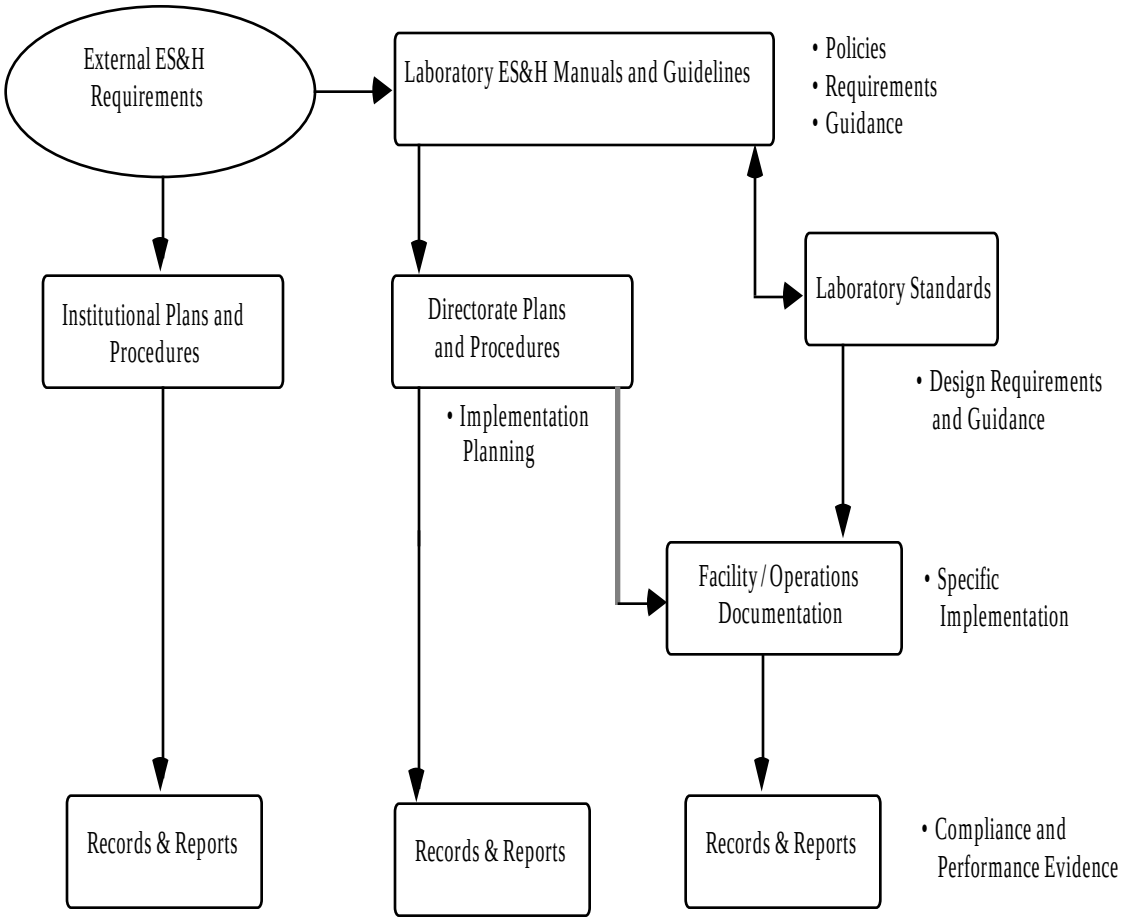

Figure 6-1. ES&H Documentation System

6.1. Laboratory ES&H Manuals and Guidelines

Several Laboratory ES&H manuals and guidelines have been issued to assist the directorates and their management organizations in implementing the Laboratory's ES&H policies and in meeting contractual and regulatory ES&H requirements. Key documents are listed in Table 6-1 below.

Title	Document No.	Issued By
Health and Safety Manual	M-010	Hazards Control Department
LLNL Radiological Control Manual	UCRL-MA-115352 (1993)	Hazards Control Department
Environmental Compliance Manual	UCRL-MA-118090 (1994)	Environmental Protection Department
Training Program Manual	UCRL-MA-106166 (1995)	Training Program Committee (Laboratory Training Manager)
On-site Hazardous Materials Packaging and Transportation Safety Manual	UCRL-MA-108629, REV. 1 (1996)	Hazardous Materials Packaging and Transportation Safety Committee

Table 6-1. Laboratory ES&H Manuals and Guidelines

6.2. Laboratory Standards

Three Laboratory engineering organizations have issued standards to ensure that components, equipment, and systems are designed and used with due consideration for safety, reliability, and quality. Where appropriate for the work activity, Laboratory standards are to be used in addition to any applicable statutory, regulatory, DOE or industry standards (also termed "non-governmental" standards). The three Laboratory standards manuals are listed in Table 6-2.

Title	Document Number	Issued by
Design Safety Standards	M-012, Rev 6	Mechanical Engineering
Electronics Engineering Standards (7 Volumes)	LED	Electronics Engineering
LLNL Facilities Standards Manual (5 Volumes)	PEL	Plant Engineering

Table 6-2. Laboratory Standards

Note: Other mandatory ES&H-related standards may be applicable to an activity. Contact the Laboratory Standards Manager or the cognizant ES&H Team for information on applicable standards.

6.3. Plans and Procedures

The following three categories of plans and procedures may be distinguished and are discussed in the following sections:

- Institutional Plans and Procedures.
- Organizational Plans and Procedures.

- Facility and Operations Documentation.

Institutional Plans and Procedures

New regulations and new requirements from UC and DOE frequently mandate that site-wide (institutional) plans and implementing procedures be developed and submitted to the regulatory agency or DOE. The principal institutional plans are listed in Table 6-3 below.

Title	Document No.	Issued By
ES&H Management Plan	UCRL-AR-120251 (1995)	Plant Operations Directorate
Draft Emergency Plan 1993	UCRL-MA-113311 (1993)	Emergency Preparedness and Response Organization
Environmental Protection Implementation Plan	UCAR-10307-96 (1995)	Environmental Protection Department
Environmental Monitoring Plan	UCRL-ID-106132 (1992)	Environmental Protection Department
Spill Prevention and Countermeasures Plans	UCRL-MA-105699 (1991)	Environmental Protection Department
Storm Water Pollution Prevention Plan	UCRL-AR-110573 (1994)	Environmental Protection Department
Hazardous Waste Management Plan	UCAR-10264-89 (1989)	Environmental Protection Department
Waste Minimization and Pollution Prevention Awareness Plan	UCRL-21215-94 (1994)	Environmental Protection Department

Table 6-3. Institutional Plans

These documents are revised as required or needed. When required, implementing procedures, and quality assurance plans and procedures are maintained by the issuing organization as separate, stand-alone documents.

In response to recommendations from the Tiger Team Review of 1990, the Tiger Team Progress Assessment of 1992, and the Technical Safety Appraisal of 1992, and other site-wide ES&H reviews of its operations, the Laboratory issued detailed Corrective Action Plans intended to respond to specific issues. These institutional plans are administered by the Plant Operations Directorate. Milestones and funding requirements to implement the corrective actions are presented in the *ES&H Management Plan.*

Organizational Plans and Procedures

The directorates and their line organizations prepare plans and procedures as required by Laboratory ES&H manuals. These documents provide management's direction, identify requirements and present guidance for implementing Laboratory ES&H policies in the organization's operations. Plans currently required are listed in Table 6-4 below.

Title	Issued By	Topic
Self-Assessment Plan	Directorates	Specifies schedules and activities for conducting self-assessments in all directorate facilities and operations
Training Program Plan	Directorates	Describes the directorate's training program and specifies training requirements
Waste Minimization and Pollution Prevention Plan	Directorates	Describes the elements in each Pollution Prevention or subordinate organization's WMPP Program Awareness organizations establishes goals and resource Plan needs

Table 6-4. Organizational Plans

In addition to these mandated plans, the directorates issue other ES&H-related plans and procedures to meet their specific organizational needs. All plans are periodically reviewed and updated as needed, and procedures to implement the plans are frequently developed by either the directorate or subordinate line organizations.

Facility and Operations Documentation

Each facility (a building or structure) at the Laboratory has been assigned to a specific Associate Director (Facility AD), who is responsible for ensuring that the facility meets the ES&H requirements stated in Laboratory manuals and that required ES&H documents are prepared. Sometimes, certain operations within a facility are the responsibility of an AD other than the Facility AD. In such cases, the AD responsible for the operation (Program AD) ensures that required plans and procedures are prepared.

The documentation required for a specific facility or operation is determined by the hazards and environmental concerns of the facility or operation, and the potential impacts from postulated accidents on employee and public health and safety, the environment, and on the programmatic mission. The several classes of facility and operations documents that may be required are:

- Safety Analysis Reports.
- Hazards Analyses.

- Operational Readiness Reviews (ORRs).
- Quality Assurance Plan and Procedures.
- National Environmental Policy Act (NEPA) Documents.
- California Environmental Quality Act (CEQA) Documents.
- Environmental Permits.
- Facility Management Plans.
- Safety Procedures.
- Conduct of Operations Plan and Procedures.
- Engineering Safety Notes.
- Self-Help Plans.

Note: Guidance on identifying ES&H concerns and preparing the required documents can be found in Laboratory ES&H manuals and guidelines, and may also be obtained from the ES&H support and advisory organizations.

6.4. Records and Reports

To document the performance of the ES&H program, a wide range of records and reports are required as briefly discussed in the following sections.

Records

ES&H records may be defined as any ES&H-related information stored on electronic, film, and paper media. By this definition, ES&H records include written documents such as: personnel medical and radiological dose records, ES&H-related internal memoranda and letters to DOE and UC, charters and meeting minutes of ES&H committees, safety procedures, ES&H training records, environmental permits, logbooks maintained by the ES&H Team technicians, internal appraisal and incident analysis reports, etc. In addition, records also include data and reports obtained during inspections, audits, tests, and measurements of facilities and equipment with safety significance, as well as calibration of equipment and instruments used in ES&H activities. Data in these records are often published in reports to DOE, regulatory agencies, and Laboratory management, unless protected by the Privacy Act.

In general, each organization determines—within the bounds of legal requirements, which are mandated for most environmental and health data—the records that must be retained and the processes for generating, marking, accounting, storing, maintaining, and disposing of them. In developing a formal Laboratory-wide records management system, the Records Management Group of the Business Services Department has released the *Records Management Interim Policy Guide.* A Records Liaison Group representing the

directorates takes actions necessary to ensure directorate compliance with the records policy, and to review additional guides.

Note: DOE has mandated a moratorium on the destruction of epidemiological records, including environmental and area hazard monitoring records, process and materials control records, health and safety procedures, work assignment and facility design data. Before destroying any ES&H-related record, contact your directorate's member of the Records Liaison Group for advice.

Reports

Reports on ES&H activities are required by Laboratory management, by DOE, and by regulatory agencies on a regular basis. These periodic reports provide evidence for the status and progress of ES&H activities, demonstrate compliance with ES&H regulations and DOE Orders, and provide feedback to Laboratory management on ES&H performance. A listing of periodic institutional reports is provided in *ES&H Documentation at the Lawrence Livermore National Laboratory*. Technical and required progress reports on LLNL environmental activities are also referenced in the annual *Environmental Report for 19xx* (where xx denotes the year). Three important reports are briefly discussed below:

- *Final Environmental Impact Statement and Environmental Impact Report (EIS/EIR) for Continued Operation of Lawrence Livermore National Laboratory and Sandia National Laboratories, Livermore (DOE/EIS-0157)*

This report was prepared to meet federal and state requirements before the DOE/UC Prime Contract (Contract 48) for the period of 1992 to 1997 could be renewed. For LLNL, the EIS/EIR describes operations at both the Livermore Site and Site 300, and analyzes the potential environmental impacts of the proposed actions; i.e., continued operation, including near-term (5- to 10-year) proposed projects. Four alternatives are also analyzed, namely:

- — No action, i.e., continue operations without further growth.
- — Modification of operations.
- — Shutdown and decommissioning.
- — UC discontinue management of LLNL after the current contract expires on September 30, 1992.

LLNL has also published a *Mitigation Monitoring and Reporting Program* document concurrently with the Final EIS/EIR. This document commits the Laboratory to mitigate some environmental impacts of its operations. The mitigation measures are being implemented.

- The Environmental Report for 19xx is a comprehensive annual report prepared for DOE, which presents:
  - — Results of LLNL's environmental monitoring and compliance effort at the Livermore site and at Site 300.
  - — An assessment of the environmental impact of LLNL operations.
  - — Compliance status of environmental activities in response to legal requirements, including a description of environmental permits and regulatory inspections, for the year specified in the report.
  - — Methods, data, and results of monitoring activities on air, soil, sewage, water, vegetation, foodstuff, and environmental radiation.
  - — Quality assurance and statistical methods.

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ES&H Acronyms

ACHD	Alameda County Health Department
ACGIH	American Conference of Governmental Industrial Hygienists
AD	Associate Director
AD/PO	Associate Director for Plant Operations
ADM	Action Description Memorandum
AEC	Atomic Energy Commission
ALARA	As Low As Reasonably Achievable
ALERT	Active Livermore Emergency Response Team
ALOO	Albuquerque Operations Office (same as ALO)
ANS	American Nuclear Society
ANSI	American National Standards Institute
ARAC	Atmospheric Release Advisory Capability
ARG	Accident Response Group
ARO	Assurance Review Office
ASME	American Society of Mechanical Engineers
BAAQMD	Bay Area Air Quality Management District
BACT	Best Available Control Technology
CAIRS	Computerized Accident/Incident Reporting System (DOE/HCD)
CAL H&S	California Health and Safety Code
CAL-OSHA	California Occupational Safety and Health Administration
CAA	Clean Air Act (Federal)
CCAA	California Clean Air Act
CCR	Code of California Regulations
CEQ	Council on Environmental Quality (Federal)
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act of 1980
CFR	Code of Federal Regulations
ConOps	Conduct of Operations
CMT	Crisis Management Team
CX	Categorical Exclusion (Re: NEPA)
DAP	Discipline Action Plan
DBA	Design Basis Accident
DBE	Design Basis Earthquake
DefTrack	Deficiency Tracking System
DNFSB	Defense Nuclear Facilities Safety Board
DOCSA	DOE Order Compliance Self-Assessment
DOE	United States Department of Energy
DOE-DP	Department of Energy - Defense Programs
DOE-EH	Department of Energy - Environment, Safety and Health

DOE-EM	Department of Energy - Environmental Restoration and Waste Management
DOE-ID-SSDC	Department of Energy - Idaho-Systems-Safety Development Center
DOE/OAK	Department of Energy - Oakland Operations Office (replaced DOE-SF)
DOE-SF	Department of Energy - San Francisco Operations Office (replaced by DOE/OAK)
DOT	United States Department of Transportation
DTSC	California Department of Toxic Substance Control
EA	Environmental Assessment
EIC	Environmental Impact Classification
EIR	Environmental Impact Report (State)
EIS	Environmental Impact Statement (Federal)
EMP	Environmental Management Plan
EMT	Emergency Medical Technician
EP&RP	Emergency Preparedness and Response Program
EPA	Environmental Protection Agency
EPD	Environmental Protection Department (LLNL)
EO	Executive Order of the President of the United States
EMC	Emergency Management Center (LLNL Bldg. 313)
EPP	Emergency Preparedness Plan
EPP	Environmental Protection Program
ERP	Emergency Response Program (Plan)
ES&H	Environment, Safety, and Health
FEMA	Federal Emergency Management Agency
FSAR	Facility Safety Analysis Report
FSAR	Final Safety Analysis Report
FSP	Facility Safety Procedure
FTA	Fault Tree Analysis
GOCO	Government Owned Contractor Operated
HCD	Hazards Control Department
HEPA	High Efficiency Particulate Air Filter
HMPT	Hazardous Materials Packaging and Transportation
HWCA	Hazardous Waste Control Act
HWM	Hazardous Waste Management Division of EPD
IDLH	Immediately Dangerous to Life or Health
IP	Implementation Plan
LANL	Los Alamos National Laboratory
LBL	Lawrence Berkeley Laboratory
LEDO	Laboratory Emergency Duty Officer
LLNL	Lawrence Livermore National Laboratory
LROCC	Laboratory Repository of Completed Courses
LWRP	Livermore Water Reclamation Plant
ME	Mechanical Engineering
ME-SC	Mechanical Engineering - Safety Committee

MORT	Management Oversight Risk Tree
MOU	Memorandum of Understanding
MSDS	Material Safety Data Sheet
NEPA	National Environmental Protection Act
NESHAPS	National Emission Standards for Hazardous Air Pollutants
NFPA	National Fire Protection Association
NFSC	Nuclear Facility Safety Committee
NIOSH	National Institute of Occupational Safety and Health
NOV	Notice of Violation
NVO	Nevada Operations Office
OJT	On-the -Job Training
ORAD	Operations and Regulatory Affairs Division (EPD)
ORO	Occurrence Reporting Office
ORR	Operations Readiness Review
OSH	Occupational Safety and Health
OSHA	Occupational Safety and Health Administration
OSP	Operational Safety Procedure
OSR	Operational Safety Requirement
P&P	Plans and Procedures
PAAA	Price-Anderson Amendments Act
PAP	Personnel Assurance Program
PRAP	Proposed Remedial Action Plan
PE	Plant Engineering Department
PEL	Permissible Exposure Limit
PHA	Preliminary Hazards Assessment
PHS	Public Health Service
PIN	Personal Identification Number
PPE	Personal Protective Equipment
PRA	Probablistic Risk Analysis
PRA	Preliminary Risk Assessment
PSAR	Preliminary Safety Analysis Report
QA	Quality Assurance
QAP	Quality Assurance Plan
QAP	Quality Assurance Program
QAMP	Quality Assurance Management Plan
QAPP	Quality Assurance Project Plan
RCM	Radiological Control Manager
RWQCB	Regional Water Quality Control Board
SA	Safety Assessment
SAD	Safety Analysis Document
SAR	Safety Analysis Report
SARA	Superfund Amendments and Reauthorization Act of 1976
SEN	Secretary of Energy Notice
SJCPHS	San Joaquin County Public Health Service
SJVUAPCD	San Joaquin Valley Unified Air Pollution Control District

SNL	Sandia National Laboratories
SNLA	Sandia National Laboratory Albuquerque
SNLL	Sandia National Laboratories Livermore
SOP	Standard Operating Procedure
TAC	Toxic Air Contaminants
TAP	Team Activity Plan
TLV	Threshold Limit Value
TRAQ	Training Requirements and Qualifications
TRU	Transuranic Element
TSR	Technical Safety Requirement
UC	University of California
UST	Underground Storage Tank
WAA	Waste Accumulation Area
WATS	Wastewater and Tank Systems Group (EPD)
VOC	Volatile Organic Compounds

Appendix A
Graded Approach*

A.1. Background

This document describes the concept of Graded Approach as applied to the implementation of the requirements contained in specific DOE orders. It is intended to provide clarification of the concept of Graded Approach for use by the DOE and its Management and Operations (M&O) contractors.

A.2. Concept

Graded Approach is the process used by the M&O contractor, DOE field office, or DOE Headquarters organization to determine how to apply specific mandatory requirements contained in a DOE order to a given structure, system, component, process, or procedure (SSCPP). The result of this determination is not whether a particular requirement is applicable or not, but instead addresses the degree of implementation needed for a specific requirement at a given SSCPP based primarily on the hazards associated with the SSCPP.

The Graded Approach shall be applied to all mandatory order requirements concerned with the design, construction, operation, and decommissioning of facilities with the potential of affecting safety. It is expected that a Graded Approach may not be applicable to a number of federal, state, or local laws and regulations.

A.3. Implementation/Application

The M&O contractor or DOE organization responsible for the implementation of a requirement shall apply the Graded Approach after it has been determined that the requirement is applicable to the site or organization. For example, orders containing requirements directed to nuclear reactor internals are not applicable to many contractors and DOE organizations. The applicability decision is made at the site or organizational level through the normal contractual process.

After it has been determined that an order or requirement is applicable, the responsible organization must apply the Graded Approach to determine HOW it will implement the order. Although the requirement is mandatory and applicable, it may not make sense to apply it the same way for every building, facility, functional department,

* This was Appendix A to the US DOE Order Compliance Self-Assessment Instructions, Rev. 0, 8/13/91 from the Office of the Assistant Secretary for Defense Programs.

system or component. A limited and not all-inclusive list of topics that could be considered with respect to SSCPP in this determination follows.

A.3.1. Hazards associated with the SSCPP.

The hazards classification of the SSCPP should be the major factor considered when considering how a particular requirement will be implemented. Hazards to consider include those with the potential for causing death, injury, or damage to equipment, property, or to the environment. When determining the hazards associated with the SSCPP, the following topics should also be considered:

a. Functions and missions of the SSCPP.

b. Operational characteristics of the SSCPP. For example, the operational characteristics of a plant are different when it is shutdown compared to when it is operating.

A.3.2. Scope, purpose, and intent of the order.

A.3.3. Consequences of failure or malfunction of an SSCPP with respect to how an order will be implemented.

This topic is included to identify SSCPPs whose failure is not in itself hazardous but could lead to unacceptable consequences. This consideration is not intended to suggest a risk analysis or failure modes and effects analysis, only that a reasonable process be used to determine consequences of failure. For example, the requirements for instrument calibration may apply to a particular instrument, not because malfunction is directly hazardous to public or worker safety or to the environment, but because malfunction could lead to emissions in excess of safety limits.

A.3.4. Alternatives that may be implemented that satisfy the intent, purpose, and scope of the order requirement.

The Graded Approach shall be consistently applied throughout an organization. For each requirement or set of requirements, the responsible organization shall determine how the requirement will be implemented. The organization should be prepared to justify its Graded Approach decisions. DOE shall perform independent assessments of the methods used and results obtained.

Appendix B
Roles, Responsibilities and Authorities for ES&H

This document defines the roles, responsibilities and authorities with regard to ES&H matters for LLNL line management, staff and employees, as well as for personnel and organizations providing significant ES&H support.

B.1. Executives

Director

Role - The Director of the Laboratory is the Laboratory's Chief Executive. He is also an official of the University of California. As Chief Executive, the Director manages and is accountable for all Laboratory operations and activities, including ES&H activities.

Responsibilities - The Director's ES&H responsibilities are to:

- Ensure the implementation and overall effectiveness of the Laboratory's environmental, safety and health programs.
- Ensure that the Laboratory complies with applicable federal, state and local ES&H laws and regulations, and with Contract 48 requirements.
- Maintain open communications on ES&H matters with the Laboratory's workforce, the public and, at the senior level, with external agencies.
- Chair the Senior Management Council.

Authorities - The Director has the authority to:

- Approve the startup and shutdown of programs.
- Appoint senior managers and delegate responsibilities and authorities to them, and to other LLNL employees.
- Approve institutional plans and organizational arrangements, including ES&H.
- Approve institutional policies, including ES&H policies.
- Approve budgets for LLNL operations, including budgets for institutionally funded ES&H activities.

Deputy Director Science & Technology

Role - The Deputy Director for Science and Technology is selected by the Director, confirmed by the Regents, and is an official of the University of California. He assists the Director in the overall management of the Laboratory.

Responsibilities - The DDS&T's ES&H responsibilities are to:

- Represent the Director in his absence.
- Provide a point of management contact in the Director's Office for science and technology issues.

Authorities - The DDS&T has the authority to:

- Act for the Director in his absence.
- Oversee science and technology activities at the Laboratory.

Deputy Director Operations

Role - The Deputy Director for Operations (DDO) is selected by the Director and confirmed by the Regents and, among other duties, assists the Director in discharging his ES&H operational responsibilities.

Responsibilities - The DDO's ES&H responsibilities are to:

- Approve draft policies.
- Provide direction to the (ES&H) working groups and committees and resolve outstanding issues.
- Manage the Laboratory's indirect functions, including ES&H resources.
- Balance the Laboratory-wide ES&H, business, administrative and operational resources as they cross-cut the Laboratory, both when integrated and imbedded in programs and when performed by support organizations.
- Develop policies, standards and procedures for Laboratory-wide business, administration and operations activities.
- Serve as principal implementor of quality-based management at the Laboratory.
- Ensure the satisfactory achievement of performance measurement goals as specified in Contract 48, Appendix F.
- Provide liaison with the Senior Management Council and the ES&H Working Group.

- Communicate to the Director those ES&H management issues that require the Director's decision or approval.
- Provide oversight of LLNL ES&H and Quality Management.
- Oversee the activities of the Assurance Review Office (ARO), and PAAA Project Office.
- Communicate with Laboratory line management on ES&H operations and oversight matters.

Authorities - The DDO has the authority to:

- Approve requests to outside agencies for exemptions and variances from mandatory codes, standards and DOE order requirements.
- Review and/or approve communications involving Laboratory commitments on ES&H matters with outside agencies and DOE.
- Approve and issue legally mandated and DOE directed ES&H Implementation Plans, Procedures, and Guidelines.
- Issue ES&H-related oversight directives to Associate Directors.

B.2. Senior Managers

Associate Directors

Roles - The director has delegated to the Associate Directors (ADs) the direct responsibility for conducting the Laboratory's programmatic work, and primary responsibility for implementing the Laboratory's ES&H policies in the performance of that work. In carrying out these responsibilities, each AD can simultaneously function in one or more of the following three roles: as Program AD, as Facility AD, and as Payroll AD.

- The Program AD is responsible for carrying out program operations.
- The Facility AD is responsible for operating and maintaining the assigned facilities (buildings or areas).
- The Payroll AD is responsible for supplying the workforce belonging to his/her payroll accounts to the program operations and/or to the facility operations and maintenance.

General responsibilities are assigned to all ADs and each role carries with it some specific ES&H responsibilities.

General Responsibilities - All ADs are to:

- Be aware of legal, regulatory and contractual ES&H requirements applicable to his/her operations and facilities.

- Establish a management system consisting of plans and procedures that provide for and ensure the implementation of Laboratory ES&H polices and requirements in the directorate's line organization and assigned facilities.

- As a member of the Senior Management Council, review and recommend new and revised ES&H policies to the Director for approval.

- Communicate significant ES&H information (e.g., issues, occurrences, non-compliances, etc.) to the Director's Office.

- Ensure that a self-assessment program is conducted of its operations and in its facilities to verify that the ES&H program is effectively implemented.

- Ensure that the performance with respect to ES&H is part of each employee's annual performance appraisal.

Program AD Responsibilities - The Program AD is to:

- Ensure that Laboratory ES&H policies are integrated into the program's plans and activities.

- Ensure that the program's operations and activities are conducted safely and comply with applicable ES&H requirements.

- Ensure that the assigned Laboratory work force[3] has the proper job-related training to carry out the work, and that training requirements are documented. Provide notice of program-specific training requirements to the Payroll AD.

- Ensure that the facilities and procedures used are appropriate for the work.

- Ensure that Operational Safety Procedures are prepared, if required.

- Provide or coordinate the response to ES&H-related incidents in program operations with affected Facility and Payroll ADs, including proper notification and reporting.

Facility AD Responsibilities - The Facility AD is to:

- Ensure that facility operations are conducted safely and comply with applicable Laboratory ES&H requirements.

- Ensure the preparation and maintenance of required ES&H facility documentation.

[3] "Work force" in this document means any person engaged in an LLNL supervised activity. This includes full-time and part-time employees, contractor employees, and visiting guests.

- Ensure that
- facility-specific training requirements are identified and documented,
- notice of these requirements are provided to managers who use or provide services to the facility, and
- personnel using or working in the facility have the required training.

Payroll AD Responsibilities - The Payroll AD is to:

- Ensure that personnel belonging to the AD's payroll accounts
- have the base skills appropriate to their job classification,
- are provided the training necessary to maintain these base skills, and
- have received any institutionally required training.

- Maintain records that confirm personnel belonging to the AD's payroll accounts have the necessary base skills and meet all training requirements imposed by the institution, programs and facilities.

Authorities - All ADs have the authority to:

- Delegate ES&H authority to managers[4] in their line organizations or to directorate staff members, however, they remain accountable to the Director for both ES&H performance and assurance. In this context an AD is accountable for all responsibilities and authorities of managers reporting to him/her.

- Appoint an Assurance Manager to oversee ES&H activities within the directorate.

- Approve budgets and expenditures for programmatic or functional activities, including funding of ES&H-related activities.

- Approve directorate-level ES&H plans and procedures, and other ES&H documents requiring their signature.

- Review and concur with requests for exemptions and variances from mandatory codes and standards.

- Authorize the startup and shutdown of operations and assigned facilities.

- Authorize disciplinary actions of employees who willfully ignore or fail to comply with Laboratory ES&H rules and requirements (see the *LLNL Personnel Policies and Procedures Manual (Section E.II)*).

AD/PO The AD/PO reports administratively to the Director and programmatically to the DDO and is the Laboratory's senior manager for ES&H technical support.

[4] For example, Facility ADs usually choose to delegate their facility-related ES&H authorities to a Facility (Operations) Manager or to a Division Leader.

Responsibilities - In addition to responsibilities and authorities described above for ADs, the AD/PO is to:

- Manage and provide the necessary ES&H expertise and technical support (guidance and services) to assist the other ADs and their line organizations in implementing the Laboratory's ES&H policies.

- Implement Laboratory ES&H policies and requirements in his/her line organization and assigned facilities. In this context, the AD/PO has the same responsibilities and authorities as other ADs.

- Designate the LLNL ES&H Functional Manager (ES&H/FM) for DOE directives and other Contract 48 compliance and performance issues related to ES&H.

- Develop and issue the *ES&H Five-Year Plan* and other institutional planning documents.

- Prepare annual budgets for overhead-funded institutional ES&H activities for approval by the Director.

- Manage all institutional ES&H and QA support resources.

- Maintain an awareness of current DOE orders, regulatory requirements, codes and standards and ensure that appropriate implementation guidance is issued.

- Manage and/or coordinate as appropriate the response to Laboratory-wide ES&H and QA appraisals, assessments, audits and inspections by DOE, the University and other agencies, and may track corrective actions. In general the ARO provides the Laboratory's central point-of-contact for appraisals by the University, and the DOE.

B.3. Managers

Roles - In the context of ES&H, managers are employees who plan, organize, and direct or supervise work and/or personnel in their assigned programmatic, facility or functional area.[5]

Responsibilities - Managers are responsible for all or a subset of the following, depending on job function:

- Knowing the applicable ES&H laws, regulations and Laboratory policy requirements and ensuring that they are being appropriately implemented within the manager's area of responsibility.

[5] The term "managers" includes individuals with position titles, e.g., department head, division leader, program manager, group or project leader, supervisor, team leader.

- Understanding applicable ES&H responsibilities—his/her own, as well as those distributed to interfacing organizations.

- Planning new operations with considerations for the effects on the environment, and for minimizing waste generation, environmental discharges, and safety risks during all activities.

- Designing and conducting operations to assure that employee exposure to risk conforms to the ALARA objectives, and that employee exposure to hazardous and radioactive materials does not exceed regulatory limits.

- Conducting and documenting ES&H Evaluations for new projects and activities.

- Ensuring that employee job descriptions reflect work requirements and duties.

- Ensuring that employees are trained and qualified for the work assignment, and are fit for duty.

- Ensuring records are maintained that document training and certification requirements, and the dates when training or retraining was completed for every employee assigned to the manager.

- Implementing a self-assessment program in accordance with directorate plans and procedures, and seeing that necessary corrective actions are carried out.

- Ensuring that self-help plans and emergency response procedures are prepared for operations and facilities assigned to the manager.

- Notifying the cognizant senior manager of occurrences and incidents in accordance with Laboratory notification and reporting requirements.

- Reviewing accident and incident reports, and reportable occurrences and take appropriate action to correct the situation and prevent reoccurrences.

- Immediately stopping operations in a safe manner upon discovery of an imminent danger situation, and making sure that the situation is promptly mitigated.

Authorities - Managers are authorized to:

- Delegate authorities to the next lower level in the line management chain.

- Concur with or approve the start-up of new projects and activities.

- Approve organizational and facility ES&H plans and procedures.

- Allocate resources or request resources from the next higher management level to establish safety and environmental protection programs, obtain technical support and assistance from ES&H functional organizations, and correct deficiencies and non-compliances.

- Appoint organizational safety committees and incident analysis teams.

- Stop, in a safe manner, any activity that the manager judges to be unsafe or harmful to the environment or in violation of legal ES&H requirements and Laboratory policies.

B.4. Supervisors

Roles - In the context of ES&H, supervisors directly assign, control, monitor, and evaluate the day-to day work activities of employees, contract personnel and visitors assigned to their organizational unit.

Responsibilities - Supervisors are responsible for all or a subset of the following, depending on job function:

- Informing employees of all health and safety hazards in the workplace, and instructing them on how to protect themselves from those hazards.

- Providing employees with Material Safety Data Sheets and other health and safety information.

- Ensuring that employees are provided with the correct protective equipment and clothing, and are trained in its use.

- Ensuring that required access controls, signs, alarms and warning devices are installed and functioning.

- Arranging for and obtaining medical clearances for employees working with specific health hazards.

- Training employees to carry out their obligations, which includes knowing and understanding the potential ES&H impacts of their work and their responsibility to conduct their work safely.

- Documenting and applying safety procedures as required.

- Taking actions to minimize the generation of waste and enforcing requirements on:
  — Laboratory waste handling practices
  — Environmental permit conditions
  — Pollution prevention

- Monitoring operations and activities regularly and correcting an ES&H-related problem immediately if it poses an imminent danger, or informing the manager who can take corrective action, and documenting the action taken.

- Taking immediate actions to control incidents and emergencies, ensuring that injured or ill employees report to health services, and notifying the next higher level of management.

- Evaluating ES&H performance of employees in accordance with Laboratory guidance on performance appraisals.

Authorities - Supervisors are authorized to:

- Assign specific tasks and work areas to employees.

- Approve requests for protective equipment and clothing used by employees.

- Write, review, concur with, or approve safety procedures in accordance with the guidance in the*Health and Safety Manual.*

- Obtain employee exposure monitoring records from the Hazards Control Department, as needed.

- Review and verify training records, and determine when an employee is qualified for specific tasks.

- Temporarily may suspend an employee's qualification "for cause" and request a "fitness for duty" evaluation by Health Services.

- Order operations be stopped immediately and in a safe manner upon discovery of an imminent danger situation, and make sure that the situation is promptly mitigated.

B.5. Employees

Responsibilities - Each employee is to:

- Know and understand the ES&H requirements of his/her assignment, and the potential hazards in the work area.

- Participate in all required ES&H training and health monitoring programs.

- Perform his/her work assignment in full compliance with applicable ES&H requirements as published in Laboratory manuals and guidelines, and with the controls established in safety procedures.

- Correct an ES&H-related problem immediately or inform the supervisor of the problem.

- Warn fellow employees and visitors of hazards and defective equipment.

- Know emergency plans and procedures for the work area.

- Request that work be stopped when observing others performing an operation that is perceived to be imminently dangerous.

Authority - Employees are authorized to:

- Direct that work within their area of responsibility and technical expertise be stopped when observing others performing an operation that is perceived to be imminently dangerous.

B.6. ES&H Technical Support

This section summarizes the key ES&H responsibilities and authorities of the ES&H organizations managed by the AD/PO.

B.6.1. ES&H Support Organizations

Role - ES&H expertise and technical support to Laboratory line organizations is provided by four functional organizations reporting to the AD/PO:

- Hazards Control Department
- Environmental Protection Department
- Health Services Department
- Quality Assurance Office

Responsibilities - In general, the organizations are responsible to the AD/PO for performing the following functions:

- Interpreting DOE directives and, in collaboration with Laboratory Counsel, ES&H laws and regulations.

- Developing or revising Laboratory policies for review by the ES&H Working Group and Senior Management Council and approval by the Director.

- Developing policy implementation guidance for review and approval by the ES&H Working Group.

- Publishing ES&H and QM/QA manuals, guidelines and other supplemental information on how to satisfy ES&H and QA requirements.

- Developing and conducting ES&H and personnel assurance program training.

- Reviewing operations and procedures, and advising on appropriate protective measures and controls.

- Assisting line organizations with preparing safety, environmental and quality management documentation.

- Monitoring operations and work sites to provide management with the information needed to help maintain a minimal-risk work environment.

- Providing services and direct support to line organizations to aid them in meeting their ES&H requirements.

- Providing health services, such as examinations, treatments, consultations, agent-specific health surveillance, and fitness-for-duty evaluations.

Authority - Members of the ES&H functional organizations are authorized to order other employees to stop work on any operation evaluated as being imminently dangerous.

B.6.2. ES&H Teams

Role - The four ES&H Teams, organized through the Hazards Control Department, provide the key interface between the line organizations and the ES&H support organizations. These Teams comprise safety and environmental specialists and technicians from Hazards Control and the Environmental Protection Departments. Each Team supports one or more directorates .

Responsibilities - The primary responsibilities of the ES&H Team are to:

- Provide ES&H technical support during normal operations and emergencies.

- Assist line organizations in identifying and analyzing health and safety hazards and environmental concerns in their operations.

- Advise line organizations of appropriate controls to eliminate or minimize the identified hazards and concerns.

- Advise line organizations of applicable ES&H codes, standards, regulations, and DOE orders in a manner consistent with Laboratory policy, and assist line organizations in meeting mandatory requirements.

- Assist line organizations in environmental compliance actions; obtain environmental permits and variances as needed.

- Monitor the work environment for compliance with the *Health and Safety Manua*l, *LLNL Radiological Control Manual, Environmental Compliance Manual* and *Environmental Guidelines,* applicable safety procedures, codes, standards, regulations and DOE orders, and advise management on noncompliances.

- Take appropriate steps to ensure that any activity that presents an imminent, uncontrolled high-risk threat to human safety, health, or the environment is immediately stopped.

- Implement the ES&H Teams *Discipline Action Plans (DAPs)* for each safety discipline.

- Provide guidance to line management in the development of safety-related procedures and documents (e.g., safety procedures, Radiological Work Permits, design reviews, etc.) and review such documents.

- Assist the Hazards Control Training Group in the development and teaching of ES&H training courses.

- Assist in the analysis/investigation of accidents or incidents.

B.7. Groups With Specific ES&H Responsibilities

B.7.1. Senior Management Council

Role - The Senior Management Council (SMC) advises the Laboratory Director on Laboratory policies and oversees the effectiveness of activities and programs toimplement these policies. The SMC is composed of the Director (Chair), the Deputy Directors, and all Associate Directors.

Responsibilities - The SMC is responsible for the following ES&H functions:

- Review Laboratory policies and recommend changes to the Director.

- Assure the implementation of these policies and review the effectiveness of their implementation.

- Discuss accidents, incidents, audits and reviews at LLNL and other DOE contractor facilities to identify lessons learned and ensure that these lessons are incorporated into Laboratory operations.

- Establish and oversee working groups and committees as appropriate.

- Provide a forum to receive input from Laboratory employees and ensure that they are adequately informed.

- Review proposed exemptions to standards and regulations.

- Review and resolve outstanding institutional issues.

Authority - The SMC is authorized to:

- Observe operations and activities and recommend corrective actions.
- Recommend exemptions to standards and regulations.

B.7.2. ES&H Working Group

Role - The ES&H Working Group supports the DDO and SMC. Its broad membership and close association with the DDO and SMC provides a key mechanism for across-the-Laboratory reviews of proposed ES&H policies and issues and the development of effective ES&H guidance.

The ES&H Working Group (ES&H WG) consists of the assurance managers from each directorate and the heads of the four ES&H functional organizations.

Responsibilities - The ES&H WG is to:

- Respond to requests for reviews and studies by the DDO.
- Review and develop LLNL implementation plans to meet federal, state, and DOE requirements.
- Address ES&H and QA issues raised by the programs and prepare recommended actions for consideration by the DDO and SMC.
- Review generic or institutional ES&H and QA issues, and bring these to the attention of the DDO for policy development or change.

Authority - The ES&H WG is authorized to:

- Approve (for the DDO's signature) ES&H implementation guidance developed by the ES&H functional (support) organizations for issue in ES&H manuals.

B.7.3. Assurance Review Office

Role - The Assurance Review Office (ARO) provides an independent, internal ES&H appraisal program to assure that Laboratory ES&H policies and their implementation are consistent with Laboratory requirements, DOE orders, and ES&H regulations.

The manager of the of ARO reports to the DDO.

Responsibilities - The ARO is to provide the following functions:

- Conduct assessments and appraisals, review and evaluate directorate self-assessments and verify the results achieved by LLNL ES&H/QA activities .
- Document and report the results of the ARO's independent assessments, audits and appraisals.
- Provide the central point of contact for external (e.g., DOE, University, etc.) assessments, audits and appraisals of Laboratory operations. This includes coordination among the affected Directorates of review activities and any response required.
- Appraise whether ES&H deficiencies are being corrected in a timely manner and report to the DDO on their significance.
- Manage and maintain the data base for deficiency tracking (called DefTrack).
- Trending and Lessons Learned, and root cause analysis applied to these.

Authorities - The ARO is authorized to:

- Review organizational records and documents, and to observe operations and activities.
- Contract outside experts to assist in performing assessments, appraisals and reviews.

B.7.4. Price-Anderson Amendments Act Project Office

Role - The Price-Anderson Amendments Act (PAAA) Project Office serves as the point-of-contact for LLNL with the UC, other laboratories, and the DOE for all LLNL nuclear facility rule making activities and will manage the development of rule implementation plans.

Responsibilities - The PAAA Project Office performs the following functions:

- Manage development of PAAA Implementation Plans.

- Provide a single point-of-contact with UC, DOE and other laboratories regarding PAAA rule activities.

- Act as the Laboratory's PAAA Coordinator concerning noncompliances of PAAA rules.

- Provide the Laboratory's central point-of-contact for interactions with the Defense Nuclear Facilities Safety Board.

Authorities - The PAAA Project Office has the authority to:

- Request information required by the DNFSB.

- Have developed and review PAAA rule implementation plans and monitor conformance with these plans.

B.7.5. Office of Laboratory Counsel

Role - The Laboratory Counsel is appointed by and reports to the Laboratory Director. The role of the Laboratory Counsel is to provide legal services such as representation, consultation, advice and recommendations to Laboratory management.

Responsibilities - The Office of Laboratory Counsel is responsible to:

- Coordinate legal matters with Laboratory management, the General Counsel of the University of California, and when necessary, the DOE legal counsel.

- Represent the Laboratory, executives, senior managers and the Regents of the University of California in connection with litigation involving the Laboratory that may arise in California and federal courts.

- Interpret and advise on the provisions of the Prime Contract (Contract 48).

- Interpret federal, state and local laws, and provide advice about statutory and regulatory compliance.

B.7.6. Office of Contract Management

Role - The Office of Contract Management (OCM) administers and coordinates the Prime Contract W-7405-ENG-48 (Contract 48). The OCM is the Laboratory's institutional point-of-contact with the University of California, DOE, Lawrence Berkeley National Laboratory (LBNL), and Los Alamos National Laboratory (LANL) regarding Contract 48. As such the OCM is the official:

- recipient of proposed contract modifications and DOE directives and formal Contract 48 communications, and

- contact with the UC Laboratory Administrative Office (UC/LAO) on all matters related to Contract 48.

Responsibilities - The OCM is to:

- Disseminate information related to Contract 48 and its administration Laboratory-wide.
- Identify and record LLNL Functional Managers and Offices of Primary Responsibility, as assigned by the Director's Office and/or cognizant Associate Director, for contract compliance and reporting purposes.
- Coordinate the annual Laboratory Contract 48, Appendix F self-assessment process.
- Record, track, and inform Laboratory management of Prime Contract reporting commitments and actions.
- Coordinate and transmit the Laboratory's official position for proposed contract modifications and DOE directives to the University and the other Laboratories' points-of-contacts.
- Interpret the Prime Contract, as necessary, in coordination with the UC/LAO and LLNL Office of Laboratory Counsel as appropriate.

B.7.7. Training Program Committee

Role - The overall view of the LLNL training program is provided by the Training Program Committee (TPC). This committee was chartered to provide an awareness and overview of the training program at the Laboratory and to resolve training issues as appropriate.

Responsibilities - The TPC is to:

- Develop and recommend policy for required training to the Director’s Office.
- Communicate the Laboratory’s training policy and provide guidance through the *LLNL Training Program Manual*, the training policy document for the Laboratory.
- Maintain the *LLNL Training Program Manual* and recommend changes to that document to the DDO for approval.
- Review and approve the introduction or removal of institutional training requirements (ITRs).
- Review and approve any substantive changes in the record-retention process.

B.7.8. Institutional ES&H Committees

Several institutional ES&H committees have been chartered to address specific safety issues such as:

- Traffic Safety
- Criticality Safety
- Firearms Safety
- High Explosives Safety
- Electrical Safety
- Biosafety
- Institutional Animal Care

These committees are chartered to evaluate ES&H-related issues and to propose policies and procedures to the ES&H Working Group to improve specific areas of LLNL's safety performance. Members of these committees are chosen for a combination of their technical expertise, knowledge of Laboratory programs and culture, and to meet the requirements of national guidelines or DOE orders.

B.8. Individuals with Specific ES&H Responsibilities

B.8.1. Assurance Manager

Role - The Directorate Assurance Manager (AM) is appointed by and directly responsible to the AD or the appropriate Deputy AD with direct access to the AD. The primary role of the AM is to provide oversight of the directorate's ES&H activities for the AD. AMs shall not have line responsibility for implementing any aspect of the ES&H program for which they have oversight responsibilities.

Responsibilities - The Assurance Manager is to:

- Be a member of the ES&H Working Group and participate in addressing and resolving institutional and cross-directorate ES&H issues.

- Assist in the development of directorate ES&H plans and procedures for approval by the AD

- Provide oversight of the directorate's line organizations, facilities and activities to assure the proper implementation of the ES&H program within the directorate.

- Perform independent assessment of the ES&H program within the directorate.

- Be the primary directorate contact with LLNL Assurance Review Office (ARO) and for external ES&H audits and assessments.

Authorities - The Assurance Managers:

- Have the authority to stop any activity that the manager judges to be unsafe or harmful to the environment or in violation of legal ES&H requirements and Laboratory policies.

- Have direct access to the AD and has the authority to represent the AD in the ES&H Working Group.

B.8.2. Laboratory Training Manager

Role - The Laboratory Training manager is the Laboratory's primary resource person regarding policies, guidelines and standards for required training, including ES&H-related training. The Laboratory Training Manager manages the Laboratory Repository of Completed Records (LROCC) database system.

Responsibility - The responsibility of the Laboratory Training Manager is to:

- Respond for the Laboratory to requests for participation at policy- and standard-setting meetings of external agencies.

- Interpret external training requirements and make recommendations for their implementation at the Laboratory.

- Maintain and distribute the LLNL *Training Program Manual* as an assigned document and recommend revisions to the Training Program Committee for review and approval.

- Maintain the list of Institutional Training Requirements (ITRs)

- Manage the Laboratory Repository of Completed Courses (LROCC) database system

- Manage enhancements to the Laboratory's Training Requirements and Qualifications (TRAQ) database.

- Chair the Laboratory's Training Working Group (TWG)

B.8.3. Directorate Training Contact

Role - Each directorate has a Directorate Training Contact (DTC) whose **r**ole is to serve as the directorate's primary point of contact to the Laboratory Training Manager's Office, Laboratory training organizations and the directorate's line organizations.

Responsibilities - The DTC is to perform the following functions:

- Disseminate training information from the Laboratory Training Program Manager's Office and from the training/teaching organizations to personnel within the directorate.

- Coordinate directorate activities for the Training Requirements and Qualifications (TRAQ) or TRAQ-equivalent computer codes.

- Inform the Laboratory Training Manager's Office of significant changes in the directorate's training plan.

- Address questions from employees within the directorate regarding the annual training profiles.

- Assist the directorate in completing self-assessments of its training plan, and coordinate the implementation of required changes to the directorate training program.

Authority - The DTC is authorized to:

- Approve access for directorate personnel to the Laboratory Repository of Completed Courses (LROCC) database.

B.8.4. Laboratory Emergency Duty Officer

Role - Laboratory Emergency Duty Officers (LEDO) are appointed by the Director to act for the Director on emergency and related non-emergency issues.

Responsibilities - The LEDO is responsible for:

- Serving as the Emergency Manager (EM) when on-duty until relieved by the Director or his designee.

- Being available at the request of the EM or the deputy EM, to aid in the assessment, mitigation and recovery from operational emergencies by providing assistance at the event site or serving on the emergency management team.

- Ensuring that events/conditions that are indicative of an operational emergency are recognized and classification criteria applied to estimate event severity in a timely manor.

- Integrating normal/off-normal operations.

- Transitioning to and from emergency response modes.

- Activating other internal and external emergency response organizations, as needed.

- Communicating emergency and related non-emergency information to the appropriate organizations and individuals.

Authorities - The Director has delegated the on-duty LEDO with the full authority to take any actions necessary to:

- Protect the health and safety of LLNL employees, the public, the environment and the maintenance of security of the LLNL facility.
- Prevent or preclude property damage.
- Assure that appropriate notifications are made when emergency incidents occur.

B.8.5. ES&H Functional Manager

Role - The LLNL ES&H Functional Manager (ES&H/FM) is designated by the AD/PO to represent the Laboratory to the University and DOE in the ES&H functional area.

Responsibilities - The ES&H/FM is responsible to:

- Act as the interface between the University and LLNL organizations that have the primary responsibility for performance measures and/or ES&H Contract issues.
- Develop and recommend modifications to Contract performance management goals and performance measures in coordination with the UC/FM and FMs from the other University Laboratories.
- Manage the annual intra-Laboratory Appendix F ES&H self-assessment process.
- Communicate Contract operational issues and requirements within the Laboratory and with the UC/FMs, the DOE, and external and internal reviewers and audit agencies.

Appendix C
Overview of the Regulatory Environment

C.1. Introduction

The Laboratory's policy is to comply with federal, state, and local laws, regulations and ordinances and with specific DOE directives listed in Contract 48. These external sources and their associated standards result in numerous ES&H requirements for the Laboratory as depicted in Figure C-1. The following discussion provides a brief overview of the regulatory environment under which the Laboratory operates.

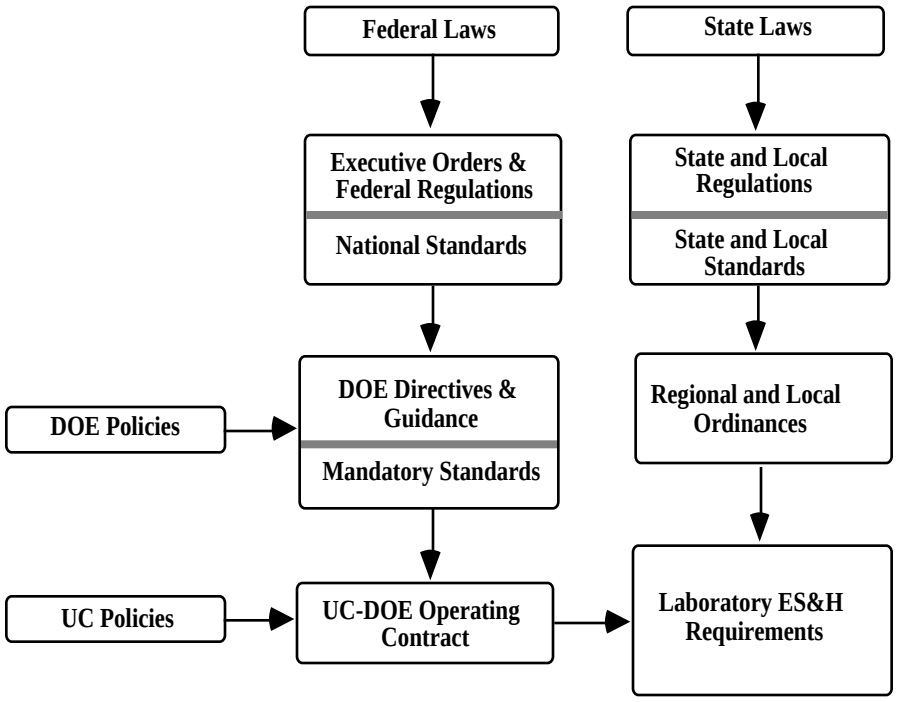

Figure C-1. Regulations and the Laboratory

C.2. Federal Laws

Federal laws are enacted by the U.S. Congress and are known as acts or statutes. Some of the ES&H-related statutes applicable to the Laboratory are:

- Clean Air Act (CAA).
- Clean Water Act (CWA).
- Resource Conservation and Recovery Act (RCRA).
- National Environmental Policy Act (NEPA).
- Comprehensive Environmental Response, Compensation and Liability Act (CERCLA).

- Occupational Health and Safety Act (OSHA).
- Superfund Amendments and Reauthorization Act (SARA).
- Toxic Substance Control Act (TOSCA).
- Oil Pollution Prevention Act.
- Endangered Species Act.

For each of these statutes a federal agency has developed detailed regulations, requirements and standards that were promulgated in the Code of Federal Regulations (CFR). For example, the Environmental Protection Agency (EPA) developed regulations and standards for environmental statutes. Many environmental statutes include civil and criminal penalties for violations of their regulatory requirements.

C.3. Executive Orders

Certain Presidential Executive Orders (EOs) provide specific directives to federal agencies with respect to the applicability of environmental legislation, clarify compliance requirements, and establish exemption mechanisms.

C.4. State Laws

LLNL complies with applicable California state ES&H laws and regulations. Important California environmental laws applicable to the Laboratory include the:

- Hazardous Waste Control Act (HWCA).
- Porter-Cologne Water Quality Control Act (Porter-Cologne Act).
- California Clean Air Act (CCAA).
- California Environmental Quality Act (CEQA).
- California Aboveground Petroleum Storage Act.

State of California ES&H laws are implemented through regulations promulgated in the California Code of Regulations (CCRs) and in the California Health and Safety Code (Cal H&S Code). California laws and regulations related to safety and environmental protection are frequently more stringent than federal requirements.

Implementation and enforcement of state and some federal environmental regulations is assigned to various government bodies. These include statewide agencies, special districts, counties, regional and local boards. For example, Regional Water Quality Control Boards (RWQCBs) monitor and enforce compliance with the state Porter-Cologne Act and the federal CWA.

C.5. Local Ordinances

Under state laws, local governments—the City of Livermore, for example—may impose additional rules, requirements and limitations. The Laboratory must therefore comply with the discharge limits to the Livermore Water Reclamation Plant (LWRP) sanitary sewer in both quantity and quality. These discharge limits are set forth in the City of Livermore Municipal Code.

C.6. DOE Directives

Contract 48, Article XIV - *Environment, Health and Safety,* requires the Laboratory to comply with DOE directives accepted by the University of California and listed in Appendix G - *Treatment of DOE Orders.* DOE directives are documents issued by DOE for the purpose of imposing standing operational requirements and obligations on the University, and thus on the Laboratory. Examples of directives in Appendix G of Contract 48 include:

- DOE Orders.
- Management Directives issued by the DOE–Oakland Operations Office (MD/OAK).
- Notices
- Secretary of Energy Notices (SENs).
- Rules and regulations.
- Policy memoranda and/or written clarification(s).
- Directive Management Document

The relevant ES&H orders include primarily those in the 5400 series, as well as one or more other 5000 series orders. At present, Section I of Appendix G does not contain any SENs or MDs/OAK.

Note: For more information regarding applicable ES&H laws and regulations and DOE directives contact your organization's Assurance Manager or the Laboratory's Office of Contract Management (OCM).

Appendix D
Description of the ES&H Program Elements

D.1. Overview

This section summarizes the objectives, requirements, functions and activities of the Laboratory's ES&H program elements. In addition, important regulations and DOE directives governing the program activities are identified.

The ES&H Program includes the following core programs:

- Environmental Protection Program
- Safety Program
- Health Services Program
- General Program

Each of these core programs consists of several elements which are described below.

D.2. Environmental Protection Program

The Laboratory's Environmental Protection Program (EPP) consists of the following program elements:

- Environmental Compliance
- Environmental Restoration
- Environmental Monitoring
- Waste Management
- Waste Minimization and Pollution Prevention Awareness.

The principal objectives of the EPP are to:

- Ensure that all Laboratory operations comply with federal, state and local environmental laws, regulations and ordinances and with applicable DOE directives.
- Clean up environmental contamination from past operations to acceptable standards.
- Minimize environmental impact from ongoing Laboratory operations to levels consistent with regulatory guidelines.
- Characterize and manage hazardous, mixed and radioactive waste for the Laboratory.

The **Environmental Protection Department** (EPD) has been designated as the lead environmental support organization, and provides Laboratory organizations with guidance, expertise, and assistance in meeting the EPP objectives

EPD's support functions include:

- Developing and issuing Laboratory environmental protection plans, reports, permit applications, NEPA documents, etc.
- Coordinating and monitoring the LLNL waste minimization effort.
- Interpreting regulatory requirements and developing implementation guidelines for use by Laboratory organizations.
- Developing and providing Laboratory employees with required environmental training.
- Representing the Laboratory in interactions with regulatory agencies and with the public.
- Responding to on-site emergencies with potential environmental impacts, and, in collaboration with emergency response personnel, guiding the cleanup, sampling, and reporting.
- Maintaining knowledge and informing Laboratory management of new environmental legislation that may impact operations.
- Monitoring on-site and the adjacent environment for any impacts of Laboratory operations on human health and the environment.
- Appropriately handling hazardous, mixed, and radioactive waste for treatment, storage and shipping.
- Determining compliance with environmental laws and regulations and assessing the risk to the public and the environment from Laboratory operations.

Note: In the performance of their work, Laboratory employees are required to implement and comply with the guidance issued by EPD.

D.2.1. Environmental Compliance

As discussed in Appendix A, the Laboratory must comply with numerous federal, state, and local environmental laws and regulations, and with requirements in DOE directives. Activities to meet these requirements include the following:

- Identification of Polychlorinated Biphenyls (PCBs) in LLNL equipment and controlling their disposal.
- Upgrading containment of aboveground and underground petroleum tanks and oil-filled electrical equipment, and implementing spill controls.
- Establishing controls for discharges of waste waters from retention tanks, and from operations and building outfalls to the sanitary sewer.
- Obtaining permits, as required, for air emission sources, hazardous waste treatment operations, and underground storage tanks.
- Constructing and/or operating equipment requiring permits in compliance with permit conditions.
- Upgrading building stack monitoring equipment, as needed, to meet National Emission Standards for Hazardous Air Pollutants (NESHAPs).
- Developing and implementing a computerized system for tracking and inventorying of chemicals.

- Evaluating ongoing and new operations and facilities for potential environmental problems, and implementing appropriate controls.
- Preparing and submitting to DOE documentation in compliance with the National Environmental Policy Act (NEPA), the California Environmental Quality Act (CEQA) and other laws and regulations pertaining to cultural, natural and biological resources.
- Implementing and tracking required regulatory training for employees.

D.2.2. Environmental Restoration

Past handling and disposal practices for hazardous and radioactive materials, and from leaks and spills resulted in ground water and soil contamination in various places throughout the site. At the Livermore Site, the contaminants are primarily fuel and chlorinated hydrocarbons; at Site 300 they are primarily chlorinated hydrocarbons, high explosive compounds and low-level tritium.

Under Federal Facility Agreements, the **Environmental Restoration Division**, in the Environmental Protection Department, plans, manages and conducts clean-up activities. Other applicable requirements are derived from the federal CERCLA, SARA, and CWA regulations and DOE Orders 5400.2A, 5400.4 and 5480.14. The principal activities include:

- Investigation of field sites to determine the existence and extent of contamination.
- Evaluating the impact of contamination on human health and the environment (i.e., prepare risk assessments) related to CERCLA clean-up projects.
- Investigating and evaluating alternative remediation technologies.
- Performing remediation activities.
- Managing corrections such as soil removal and ground water and surface water treatment.
- Closing inactive facilities in a manner designed to prevent future environmental impact.

D.2.3. Environmental Monitoring

The EPD conducts an extensive program of effluent and surveillance monitoring of all environmental media (i.e., air, soil, surface and ground waters, rain, sewage, foodstuffs, and direct radiation) and evaluates the impacts from Laboratory operations on the environment and public health.

The program activities are mandated by the federal CWA, NESHAP's regulations, parallel state and local regulations, as well as DOE Orders 5400.1 and 5400.5. The principal activities include:

- Establishing and maintaining monitoring networks, sampling locations, and methods and procedures for data collection.
- Collecting and analyzing environmental monitoring samples.

- Maintaining and operating the sewer monitoring system.
- Determining compliance with environmental laws and regulations governing NESHAPs emissions and discharges of water and waste water to the environment.
- Assessing risks to the environment and the public from Laboratory operations.
- Documenting the results of the environmental monitoring effort in the annual *Environmental Report*.

D.2.4. Hazardous Waste Management

All hazardous, medical, radioactive and mixed wastes generated by Laboratory operations must be managed in compliance with applicable federal and state laws, regulations, RCRA permits, and requirements in DOE directives, e.g., DOE Orders 5400.1, 5400.3, and 5820.2A. In addition, acceptance requirements for transuranic and low-level radioactive wastes at DOE sites have to be met.

The **Hazardous Waste Management Division** (HWM) in EPD supports Laboratory waste generators by performing the following functions:

- Processing, storing, packaging, solidifying, treating, or preparing waste for shipment to treatment and disposal facilities, for recycling, or for discharge to the sanitary sewer.
- Tracking and documenting the movement of hazardous, radioactive and mixed wastes from Waste Accumulation Areas (WAAs) to disposal.
- Decontaminating Laboratory equipment.
- Ensuring that containers for shipment of waste meet specifications of the Department of Transportation and other regulatory agencies.
- Responding to emergencies and participating in the cleanup of hazardous and radioactive material spills at LLNL facilities.
- Designing, operating and maintaining waste handling facilities and equipment.
- Operating the Chemical Exchange Warehouse to facilitate reuse of chemicals.

All waste generators are responsible for performing the following activities:

- Completing training in hazardous waste handling practices.
- Requesting sampling and analysis to identify unknown waste constituents.
- Segregating wastes and package it in approved containers.
- Using and filling in appropriate labels for labeling the waste containers.
- Complying with rules governing the accumulation of waste at or near the point of origin.
- Preparing waste containers for movement from the work area to a WAA and filling out an appropriate waste disposal form.
- Storing sealed waste container in the WAA.

D.2.5. Waste Minimization and Pollution Prevention Awareness

Under the Director's Waste Minimization Policy, the Laboratory is committed to minimizing waste from Laboratory operations, particularly hazardous, mixed and radioactive waste. Activities to implement this policy include:

- Developing specific goals and schedules for waste minimization activities and documenting the goals and schedules.
- Characterizing waste streams and developing a baseline of waste generation data.
- Identifying opportunities for waste minimization in on-going and new operation and projects.
- Reducing or eliminating waste through source reduction (e.g., product changes, technology changes and good operating practices) and recycling and reclamation.
- Enhancing communication of waste minimization goals, objectives, methods, techniques and successes among Laboratory organizations.
- Evaluating the effectiveness of the program and preparing an annual report, and other waste minimization and pollution prevention documents.

Pollution Prevention Awareness activities complement the waste minimization effort. These activities are implemented by the EPD, and involve primarily education and communication activities.

D.3. Safety Program

The Laboratory's Safety Program (SP) consists of the following program elements:

- Fire Protection
- Criticality Safety
- Industrial Hygiene
- Industrial Safety
- Radiation Safety
- Nuclear Explosives Safety
- Hazard Assessment and Safety Analysis

The major objectives of the SP are to:

- Provide safe workplaces, and working conditions that do not adversely affect worker health.
- Assure compliance with applicable statutory and regulatory safety requirements.
- Conduct all work safely.
- Identify safety risks and reduce them, where practical and economical.
- Limit exposure of employees to radioactive and hazardous materials, to physical agents and the contamination of property to ALARA levels.

The **Hazards Control Department** (HCD) plays a major role in the Laboratory's Safety Program. HCD's mission is to function as a leader to integrate the minimization

of risk and the control of workplace hazards into the thoughts, plans, and actions of Laboratory management and employees. In fulfilling that mission, HCD provides the technical expertise and supports Laboratory organizations and operations by performing the following key functions:

- Maintaining a staff of specialists knowledgeable in all safety disciplines and in accident investigations.
- Monitoring and supporting Laboratory operations to help maintain a minimal-risk work environment.
- Collecting, evaluating and maintaining data on employee's exposure to radioactive and hazardous materials.
- Specifying proper protective equipment for employee use.
- Publishing the Laboratory's *Health and Safety Manual* (H&SM).
- Providing safety services, e.g., radiation dosimetry and bioassays, hood and filter testing, etc.
- Calibrating radiation monitoring and measurement instruments, and other instruments used for workplace monitoring.
- Providing emergency response to accidents and incidents, and operating the Laboratory's Fire Department.
- Providing safety training and education to Laboratory employees.
- Providing hazard assessments of Laboratory facilities, and assisting programs in preparing required safety analysis documents.
- Issuing reports on safety performance as required by DOE, regulatory agencies, and Laboratory management.

D.3.1. Fire Protection

This program is designed to meet requirements in DOE Order 5480.7, Federal Regulations 29 CFR 1910, and National Fire Protection Association (NFPA) standards. The program is implemented in all LLNL facilities in accordance with the guidance in the H&SM, Chapter 25. The principal activities consist of:

- Controlling the use, storage and handling of combustible materials.
- Controlling fire hazards, for example, from welding, soldering, etc.
- Inspecting facilities and enforcing applicable fire and building codes.
- Inspecting and testing fire alarm and suppression systems.
- Maintaining a well trained and equipped emergency response force (i.e., Fire Department).

D.3.2 . Criticality Safety

This program's principal objective is to ensure that the likelihood of an accidental criticality is extremely low when processing, storing and transferring fissile materials. The program is designed to meet requirements in DOE Order 5480.24, and is

implemented in facilities that handle fissile material. Relevant Laboratory requirements and guidance are provided in H&SM, Chapter 31.

The principal activities of the Criticality Safety Program are:

- Establishing and implementing engineering and administrative controls for the handling, storage and transfer of fissile material.
- Training fissile material handlers in criticality safety.
- Installing, operating, maintaining and testing of criticality alarm systems.
- Maintaining an emergency response capability for incidents involving fissile material.
- Conducting criticality safety audits and inspections of fissile material operations in LLNL nuclear facilities.
- Developing emergency response procedures for a criticality accident, and periodically testing the procedure.

D.3.3. Industrial Hygiene

This program is designed to protect the health and safety of employees from biological, chemical and physical hazards. The program is intended to meet requirements in DOE Orders 5480.8A, 5480.10, 5483.1B, 5484.1, and OSHA regulations 29 CFR 1910 and 1926. The program is implemented in all facilities with the above-mentioned hazards. Laboratory guidance is provided in several chapters and supplements of the H&SM. The principal activities in this program are to:

- Evaluate operations and implement controls for the safe use and handling of hazardous chemical and biological materials, including carcinogens, mutagens, teratogens and blood borne pathogens.
- Inform the Laboratory's Health Services Department of employees potentially exposed to health hazards who may need medical monitoring.
- Evaluate the need for and use of respiratory and personal protective equipment, as required.
- Inspect and test laboratory hoods, HEPA filters and ventilation systems.
- Recommend controls to reduce exposure to noise, and abnormal environmental pressure, humidity and temperature and maintain an acceptable level of indoor air quality.
- Recommend controls to protect employees from non-ionizing radiation, e.g., laser light and magnetic fields.
- Inform employees of the health and physical hazards in the workplace and maintain appropriate Material Safety Data Sheets.
- Train employees in recognizing and controlling health and physical hazards in the workplace.
- Establish criteria for sanitary conditions in all facilities, including food service, storage and display areas, and in the potable water supply and distribution system.

D.3.4. Industrial Safety

The Industrial Safety program is designed to comply with federal OSHA codes and standards, e.g., 29 CFR 1910 and 29 CFR 1926, and with DOE directives and standards, including DOE Orders 5480.9, 5480.16, and 5483.1B. The program includes the following elements:

- Electrical Safety.
- Construction Safety.
- Explosives Safety.
- Seismic Safety.
- Firearms Safety.
- Pressure Safety.
- Materials Handling Safety.
- Traffic and Aviation Safety.
- General Industrial Safety.

Guidance on compliance with OSHA regulations, DOE directives and standards is provided in several chapters of the H&SM. Activities and functions of these program elements are implemented in Laboratory facilities, as appropriate. Key activities in the Industrial Safety Program include:

- Evaluating industrial hazards and implementing controls for operations and equipment.
- Monitoring work sites and reviewing work practices.
- Training employees to recognize hazards, work safely and respond to emergencies.
- Providing personal protective equipment, e.g., safety glasses and shoes, hard hats, fall protection gear, etc.
- Developing and implementing safety and emergency response procedures as required by the H&SM.
- Maintaining records of accidents, incidents, personnel injuries and illnesses, and evaluating the data for trends and root causes

D.3.5. Radiation Safety

The Radiation Safety Program's principal objectives are to ensure that radiation doses to employees and the public, and radioactive contamination in non-radiological areas will not exceed regulatory guidelines and are as low as reasonably achievable (ALARA).

This program is designed to comply with the requirements of DOE Order 5480.11 and the *DOE Radiation Control Manual* and 10 CFR 835. Laboratory guidance for implementing the Radiation Safety Program is provided in Chapter 33 of the H&SM and its supplements, and in the *LLNL Radiological Control Manual* and the Radiation Protection Plan specified by 10 CFR 835. The program is implemented in facilities that handle or store radioactive material. The key activities include:

- Incorporating engineered radiation safety features in facility and equipment designs to minimize routine and accidental radiation exposures.
- Using and storing radioactive materials and operating radiation generating equipment safely and in compliance with Laboratory safety requirements, safety procedures and work permits.
- Monitoring all employees for exposure to radiation, and documenting any occupationally related radiation doses.
- Performing workplace monitoring.
- Training employees in radiation safety and in the use of appropriate radiation monitoring and measurement instruments.
- Developing emergency procedures and providing emergency response to incidents involving radiation and radioactive contamination.
- Reviewing the effectiveness of the Radiation Safety Program through audits and appraisals.

D.3.6. Nuclear Explosive Safety

This program has been developed to assure adherence to the LLNL management agreement with the University of California that prohibits the presence or assembly of a nuclear explosive at the Livermore site and at Site 300. In addition, the program is intended to meet the applicable requirements of the DOE Order 5610 series, DOE-Albuquerque Supplemental Directive 5610.11 and DOE-Oakland Management Directive 5610.11. There are three major program elements:

- The Personnel Assurance Program (PAP) administered by the LLNL Quality Support Office as described in the *Health and Safety Manual*, Supplement 1.14.
- The control and accounting of controlled materials by the Materials Management Section of the Engineering Science Division (Engineering and Technology Transfer directorate) in accordance with the requirements and procedures in H&SM, Supplement 8.01 and the Material *Control and Accountability Manual.*
- The control of programmatic operations in accordance with the requirements in H&SM, Supplement 8.01.

The principal activities consist of:

- PAP management and coordination with DOE.
- Maintenance of the PAP qualification records.
- Administration of the substance abuse testing program
- Control and accounting of controlled materials, components and assemblies, specifically, Special Nuclear Materials (SNM), High Explosives, and their mock counterparts.
- Certification and/or verification of mock materials, components and assemblies (i.e., nuclear explosives-like assemblies (NELAs).
- Shipping and receiving of controlled materials, components and assemblies.
- Control of the design, fabrication, assembly, test, and disassembly of NELAs and their components.

D.3.7. Hazards Assessment and Safety Analysis

This program provides hazard classifications for Laboratory facilities, and assists Laboratory line and program organizations in preparing and reviewing safety analysis documents required by DOE Orders 5481.1B, 5480.23 and associated DOE standards. The HCD performs the following functions:

- Generates, documents and maintains a hazard assessment and classification for each facility that accurately reflects its current operations and inventory of hazardous and/or radioactive materials.
- Notifies the Associate Director for Plant Operations of any changes in the classification of a facility.
- Issues guidance for the preparation, review and approval of safety analysis documents.
- Prepares the analysis of credible accidents in hazard-ranked facilities, when requested by the programs.
- Provides an independent technical review of Safety Analysis Reports (SARs) generated by the programs.

Note: Program and line organizations with hazard ranked facilities are responsible for preparing safety analysis documentation.

D.4. Health Services Program

The Health Services Program consists of functions and services provided by the Health Services Department (HSD) and includes the following program elements:

- Clinical Services.
- Employee Assistance Program.

The primary objectives of the Health Services Program are:

- Promotion of health.
- Prevention and early detection of disease.
- Treatment of injury or illness occurring in the workplace.
- Promotion of a healthful work environment.

The Health Service Program is intended to implement the requirements of DOE Order 5480.8A (Contractor Occupational Medicine Program) and a multiplicity of federal and state laws addressing such areas as medical care, worker compensation, mandatory medical surveillance, medical records, blood borne pathogens, and the management of pharmaceuticals and medical waste. The program is described in Chapter 5 of the H&SM.

The **Health Services Department** (HSD) is the primary health care organization for the Laboratory. HSD works collaboratively with the Hazards Control and Environmental Protection Departments. The Department Head of Health Services serves the role of Chief Medical Officer at LLNL and in that capacity provides input for decisions made by Laboratory management that are health related. HSD staff provides clinical services and employee assistance, and offers the following occupational health services:

- Conducts multi-disciplinary work site inspection to develop information regarding health hazards and environmental conditions.
- Provides educational programs designed to address health concerns in the workplace.
- Provides Health Promotion Services including:
  - A Health Information Center.
  - Lifestyle intervention and assessments to improve cardiovascular fitness and healthy eating habits.
  - Smoke cessation clinics.
- Maintains medical records of employees.
- Provides allergy shots as a convenience to employees.

The HSD has prepared a medical emergency response plan and maintains a mobile disaster supply trailer to ensure timely and coordinated assistance in the event of a major disaster.

D.4.1. Clinical Services

The key activities performed by the HSD staff include:

- Providing health examinations for pre-placement, fitness-for-duty, return to work, and termination of employees.
- Providing periodic physical examinations at age-adjusted intervals to employees.
- Providing medical surveillance examinations for employees with job assignments involving physical, chemical or biological health hazards.
- Issuing medical approval for respirator use.
- Providing health counseling for pregnant employees and employees planning or suspecting a pregnancy.
- Performing clinical surveys for the early detection of melanoma in employees and provide employee education.
- Providing travel clinics for employees preparing to leave the country on Laboratory business.
- Counseling employees of the risk of exposure to “San Joaquin Valley Fever” when visiting or assigned to work at Site 300. HSD also performs a skin test on employees before they are assigned to work at Site 300.
- Diagnosing, providing treatment and follow-up of occupational injuries and illnesses.
- Providing first aid and emergency care, including advanced cardiac life support, for non-occupational injury or illness.
- Maintaining a capability for the decontamination and treatment of employees contaminated with chemical or radiological agents.

D.4.2. Employee Assistance Program

This program provides the following services:

- Personal counseling, evaluation and consultation to employees and family members to deal with stress, substance abuse, family problems and loss of a family member or friend.
- Short term counseling and crisis intervention.
- Assisting in the referral of employees and family members to outside resources.
- Assisting managers and supervisors in resolving employee productivity issues.
- At management's request, evaluating employees psychological ability to fulfill job requirements.

D.5. General Programs

D.5.1. Hazardous Materials Packaging and Transportation Safety Program

The Hazardous Materials Packaging and Transportation (HMPT) Program establishes responsibilities, requirements, and controls for the packaging and on-site transportation of the following three categories of hazardous materials, substances, and wastes:

- **Category 1** hazardous materials are controlled materials including:
  - — hazardous classified material
  - — classified waste
  - — non-waste quantities of fissionable and radioactive materials
  - — accountable nuclear materials
  - — explosives
  - — nuclear components and special assemblies.
- **Category 2** hazardous materials are unclassified hazardous materials, substances and wastes of negligible economic value, e.g., hazardous and radioactive wastes.
- **Category 3** hazardous materials are all hazardous material and substances other than those in categories 1 and 2, e.g., hazardous chemicals and pressurized gases.

The objectives of the HMPT Program are to ensure that operations involving the packaging and on-site transfer of hazardous materials, substances and wastes shall be conducted to:

- Protect the health and safety of employees, subcontractor employees, visitors and the public;
- Protect the environment;
- Protect the hazardous material during transport; and to
- Comply with applicable federal, state, and local regulations and requirements.

The program is intended to meet the requirements of the DOT Hazardous Materials Regulations (49 CFR 100–180), the EPA RCRA Regulations (40 CFR 115, 116 and 262), the California Code of Regulations (22 CCR, Chapter 30), and DOE Order 5820.2A. Laboratory requirements are specified in the *On-site Hazardous Materials Packaging and Transportation Safety Manual* and in Chapter 8 of the H&SM.

The HMPT Program is managed by the **HMPT Safety Committee**. The Committee performs the following functions:

- Oversees the program and ensures its implementation and coordination throughout the Laboratory.
- Approves all new and/or revised packaging and transportation procedures.
- Initiates appraisals of hazardous materials and packaging operations and tracks corrective actions resulting from such appraisals.
- Issues the HMPT Quality Assurance (QA) Plan and implementing procedures, and ensures compliance with the QA Plan.

Three Laboratory organizations have primary responsibility for implementing the HMPT Program, namely:

- Category 1 materials—Material Management Section of the Engineering Science Division, Mechanical Engineering Department.
- Category 2 materials—Hazardous Waste Management Division, Environmental Protection Department.
- Category 3 materials—Materials Distribution Division, Supply and Distribution Department.

Each cognizant organization performs the following activities for its assigned category of hazardous materials:

- Receive, package and transfer hazardous materials in accordance with approved procedures.
- Provide guidance to Laboratory personnel on the correct methods for packaging (i.e., containment), labeling and on-site transfer operations.
- Provide approved containers for packaging of hazardous materials to Laboratory employees.
- Train personnel and maintain training records.
- Perform the QA activities and maintain QA records as called out in the organization's QA Plan.
- Establish and implement controls for loading and unloading of vehicles.
- Establish and implement controls for the use of tie-downs to secure loads, and for the operation, placarding, maintenance and inspection of vehicles used to transport hazardous materials.
- Prepare emergency procedures for spills and fires involving hazardous materials and transport vehicles.

D.5.2. On-Site Preparedness

The Laboratory's On-Site Preparedness Program (OSPP) establishes responsibilities and requirements, and assigns functions and activities for emergency planning, preparedness, response and readiness assurance. Additional elements of the OSPP are:

- Site Evaluation Program.
- Self Help Program.
- Occurrence Reporting Program.

The primary objectives of the OSPP are to ensure that:

- Facility-specific and site-wide emergency response plans and procedures are prepared.
- Personnel are trained and equipped to manage and respond to credible emergencies.
- Emergencies are managed in an effective and timely manner to mitigate consequences.
- Capabilities are maintained to support and assist DOE in the event of radiological or nuclear emergencies.

The OSPP is intended to meet the requirements in DOE Orders 5500.1B, 5500.2B, 5500.3A and 5500.10, and the *DOE Emergency Management Guide.* Laboratory guidance is provided in Chapter 3 of the H&SM and in the *LLNL Draft Emergency Plan.*

The Laboratory has designated an **Emergency Response Program Administrator** to administer and coordinate all elements of the OSPP. The administrator manages the OSPP Office which provides the following functions:

- Coordinating, scheduling and publishing the duty assignments for the Laboratory Emergency Duty Officers (LEDOs) and supporting duty officers, e.g., from the Fire Department, Public Information Office, etc.
- Coordinating the Laboratory's efforts in support of various DOE emergency preparedness and response programs (e.g., ARG, FRMAC, NEST and RAP).
- Developing and publishing the *LLNL Draft Emergency Plan* and *Implementing Procedures.*
- Maintaining the Laboratory's Emergency Management Center (EMC) ready for instant activation and operation.
- Developing, providing and documenting performance-based training for LEDOs, Emergency Management Team (EMT) and EMC support personnel.
- Conducting and documenting drills and table-top exercises for EMT and EMC personnel.
- Planning, controlling, conducting and evaluating exercises involving all on-site and off-site emergency response organizations in order to test the Laboratory's emergency preparedness and response.

D.5.2.1. Site Evaluation Program

To provide a basis for the *LLNL Draft Emergency Plan*, the training of EMT personnel and for the conduct of drills and exercises, a Site Evaluation Program is implemented.

Line organizations are responsible for the following actions:

- Identify facility hazards and prepare and document hazards analyses (HAs).
- Perform facility-specific safety analyses using credible accident scenarios and document the analyses in safety analysis reports (SARs).
- Submit the HAs and SARs to the EPRP Administrator.

The **EPRP Office** uses the hazards and safety analyses to:

- Develop emergency planning zones and the *Emergency Response Guide (ERG).*
- Maintain and revise the ERG to reflect changes in facility operations, hazards, and accident scenarios.

D.5.2.2. Self-Help Program

The Self-Help Program has been established as a fundamental component of the Laboratory's EPRP. The Self-Help Program will be activated in the event of a site-wide disaster, e.g., a major earthquake. Laboratory guidance is set forth in Chapter 3 of the H&SM and in Chapter 2 of the *LLNL Draft Emergency Plan.*

Key activities performed by the **line organizations** include:

- Designating Self-Help Zone supervisors and Assembly Point leaders and defining their responsibilities and authorities.
- Developing and publishing organizational Self-Help Plans in accordance with Laboratory guidance.
- Establishing building evacuation routes and personnel assembly points, and providing self help kits at these locations.
- Participating in periodic, site-wide exercises of the Self-Help Program.

The **EPRP Office** supports the Self-Help Program by:

- Providing guidance to Laboratory organizations.
- Coordinating the establishment of Self-Help Zone boundaries.
- Publishing Self-Help Zone Maps.
- Developing and providing training for Self-Help Zone supervisors and Assembly Point leaders.
- Conducting periodic reviews of organizational Self-Help Plans, assembly point locations and self-help kits.

D.5.2.3. Occurrence Reporting Program

The Laboratory's Occurrence Reporting Program is intended to meet the requirements of DOE Order 5000.3B. LLNL policy and guidance on occurrence reporting are set forth

in Chapter 4 of the H&SM, and in the associated *LLNL Implementing Procedure - DOE Order 5000.3B.* The program is implemented by all line organizations and requires the prompt notification and/or reporting of DOE-reportable occurrences via line management to the Occurrence Reporting Office.

The **Occurrence Reporting Office** (ORO) is part of the EPRP and provides for the Laboratory a centralized reporting function to DOE. In addition, the ORO performs the following support functions:

- Maintains the LLNL Occurrence Reporting and Processing System (ORPS) computer terminal, and central files for LLNL occurrence reports.
- Maintains a cadre of trained "Occurrence Reporting Duty Officers" to provide telephonic notification to the DOE Emergency Operations Center regarding emergencies and unusual occurrences.
- Develops and conducts training for employees in the preparation of occurrence reports.
- Issues monthly and quarterly reports on the status of LLNL occurrence reports.

D.5.3. Training Program

The Laboratory's training program is defined in the *LLNL Training Program Manual*. This manual provides LLNL training policies for job-related training, including ES&H training, assigns responsibilities, establishes requirements and provides implementation guidance. Training requirements are based on operational needs, and are intended to meet requirements in federal and state regulations, and in DOE directives. Also, training requirements are stipulated as part of the ES&H performance measures under Contract 48, Appendix F (Section A, Part 1).

The goal of LLNL's ES&H training is to ensure that all personnel have the training required to protect health, and to perform their work in a competent, safe and environmentally sound manner. To that end, the following training program objectives were established to:

- Identify and document all training requirements (including those pertaining to ES&H issues) that are mandated by Laboratory management or outside authority, or otherwise determined to be necessary for performing a particular task or assignment.
- Provide mechanisms to assure that required training is accomplished.
- Document and make available all appropriate training-related information for use by authorized LLNL employees as well as for authorized external review purposes.
- Assure that the program is structured to permit adequate review and analysis of its effectiveness.
- Maintain a manual (the *LLNL Training Program Manual)* that provides guidance for implementing the program.

The management of the Laboratory's training program is a distributed task with specific responsibilities assigned to the Associate Directors (ADs), their line managers

and employees, Laboratory teaching organizations, the Laboratory Training Manager, and the Training Program Committee (see Section 4 under Roles, Responsibilities and Authorities). The Training Program Committee performs the following functions:

- Maintains an awareness and overview of the Training Program and resolves issues as appropriate.
- Reviews and concurs with all changes to the *LLNL Training Program Manual*, including the addition or removal of institutional training requirements and any substantive changes to the record-retention process or policy.

In general, the ADs, in their combined roles of Program, Facility and Payroll senior managers are required to maintain a training program plan that describes key objectives, establishes clear lines of responsibilities and communications for the training program, and identifies institutional and special training requirements. In addition, the directorates and their line organizations and facilities maintain records of training requirements and the related satisfactory course-completion records for their employees. Employees are required to attend, and are expected to satisfactorily complete, all assigned training courses.

The official records of successful course completions by employees are maintained in the Laboratory Repository of Completed Courses (LROCC) database. This database is maintained by the Information Resources Division (Human Resources Department) who receive the course-completion information from the teaching organizations.

Teaching organizations develop, or obtain and present courses to meet training requirements. Most ES&H-related courses are provided by the ES&H support organizations; i.e., the Hazards Control and Environmental Protection Departments, and by the Emergency Preparedness and Response Program. However, all directorates may provide courses to meet unique training requirements, e.g., the Plutonium Facility in the Nuclear Weapons Technology Program develops and presents courses for plutonium (fissile material) handlers. Guidance for the development, review, updating and documentation of the process, and for qualifying instructors, is provided in the *LLNL Training Program Manual*.

Changes to the *LLNL Training Program Manual*, including changes to the list of institutional courses, are developed by the Laboratory Training Manager based on input from Laboratory organizations. After review by the Laboratory Counsel's Office, and concurrence by the Training Program Committee, changes to the manual are forwarded to the Deputy Director for Operations for approval.

D.5.4. Conduct of Operations Program

The Laboratory's Conduct of Operations Program is intended to meet the requirements of DOE Order 5480.19A. LLNL guidance on the development and implementation of this program is set forth in H&SM, Supplement 2.19, Conduct of Operations. The Conduct of Operations (ConOps) requirements are being implemented in all LLNL hazard-ranked nuclear and non-nuclear facilities.

Note: The hazard ranking of LLNL facilities is performed by the Hazards Control Department (see Appendix B.3.7), which periodically issues a list of hazard classifications for LLNL facilities.

Designated "Facility Managers" or managers to whom the Facility Associate Director (see Section 4.1 for a description of the role of a Facility AD) has delegated responsibility for facility operations perform the following activities:

- Evaluate the applicability and compliance status of each of the 18 elements and associated sub-elements of the ConOps order using the H&SM, Supplement 2.19, and document the results in a ConOps workbook.

  Note: In this context, compliance means that the facility has an approved procedure and follows the procedure during operations.

- For any non-compliant but applicable elements and sub-elements, prepare an implementation plan to bring the operations into compliance. Justify, using a cost-benefit approach, if any ConOps elements (sub-elements) are not to be implemented.
- Develop implementing procedures for the non-compliant elements and sub-elements and conduct operations as per procedures.
- Maintain records of all approved ConOps procedures and related documentation and revisions.
- Provide ConOps training for supervisors, operating and maintenance personnel in accordance with LLNL institutional training requirements.
- Conduct periodic self assessments of ConOps implementation and improve operations based on the self-assessment findings.

D.5.5. Lessons Learned Program

The Hazards Control Department has implemented a Laboratory-wide ES&H Lessons Learned program to reduce the occurrence of accidents and injuries by sharing experiences of other individuals and organizations. This program gathers information from a wide range of sources throughout the United States and focuses on those issues most relevant to the Lab. Selection of the experiences for sharing is done by an advisory group that includes representatives from the Assurance Review Office, Engineering, and the Environmental Protection, Hazards Control, Health Services, and Technical Information Departments. Distribution is by electronic mail to a list of 500 managers and supervisors selected by Assurance Managers.

All Lessons Learned communications follow the basic format of “what happened, lessons learned from the incident, where to get additional information or help, and recommendations on actions to be taken.” Some topics covered include:

- Improperly Labeled Chemicals Found to be Explosive
- Voltage Checks Identify Electric Shock Hazards
- Suspect/Counterfeit Parts Continue to be Found at LLNL
- Improperly Mounted Face Plates Pose Electrical Hazards
- Serious Electrical Shock at LANL

- Smoke and Other Indicators of Possible Fire Should be Reported Immediately
- Do-it-yourself Modifications Can Be Dangerous

Managers who receive these documents are encouraged to distribute them to their employees and post them on bulletin boards.

Appendix E
External Oversight of the Laboratory's ES&H Program

This section briefly summarizes oversight of the Laboratory's ES&H Program by the following agencies:

- The University of California (UC)
- The Department of Energy (DOE)
- The Defense Nuclear Facilities Safety Board (DNFSB)
- Federal, State, and Local Agencies

E.1. University of California

Oversight of the Laboratory's ES&H Program and related issues by UC is performed at three levels:

- UC President's Council on National Laboratories, UC ES&H Panel
- UC Office of the Special Assistant for Laboratory Administration (UC/LAO)
- UC Liaison Officer

E.1.1. UC ES&H Panel

The UC ES&H Panel of the President's Council visits the Laboratory at least annually for in-depth reviews of the ES&H Program with a focus on major operational and technical issues. The UC ES&H Panel makes its recommendations to the President of the University through the President's Council.

E.1.2. UC/LAO

The Office of the Special Assistant for Laboratory Administration (UC/LAO) was specifically established by UC to:

- Manage the Prime Contract between the University and the DOE,
- Provide enhanced UC oversight of the Laboratory's contractual compliance, and
- Review the Laboratory's management performance under the Prime Contract.

The UC/LAO has appointed a Functional Manager for ES&H (UC/FM) who interacts with a Laboratory appointed counterpart (see Section 4.6 of this document). Among other responsibilities, the UC/FM for ES&H assesses contractual compliance and oversees ES&H activities.

A key element in UC's management oversight is termed "Performance-based Management." Appendix F to Contract No. W-7405-ENG-48, Section A, Part I includes objective performance measurement goals that are established annually by UC and DOE (with Laboratory input). The UC/FM monitors the Laboratory's progress in meeting

ES&H-related performance measurement goals. The Laboratory is also required to conduct an annual self-assessment to evaluate its management performance with respect to having met the measurement goals. The UC/FM oversees the Laboratory's self-assessment. Ultimately, the process results in an overall performance rating for Laboratory executives and senior managers.

E.1.3. UC Liaison Officer

The UC Liaison Officer, who is stationed on-site, strengthens the University's management and oversight of the Laboratory. Working closely with the Director's Office, and other managers, the Liaison Officer is responsible for keeping the University informed of all pertinent activities, issues, problems and trends, including ES&H issues.

E.2. Department of Energy

The Department of Energy (DOE) exercises oversight of the Laboratory ES&H Program through reviews, appraisals, and inspections conducted by:

- DOE/Headquarters Offices (DOE/HQ)
- DOE/Oakland Operations Office (DOE/OAK).

E.2.1. DOE Headquarters and Oakland Operations Offices

Functional (i.e., ES&H discipline-oriented) appraisals are performed regularly by appropriate DOE/HQ and/or DOE/OAK organizations. Technical specialists from DOE contractor organizations usually participate in the appraisals. The focus of the appraisals is on compliance with requirements in relevant DOE directives (DOE Orders, DOE Standards, DOE/OAK Management Directives). Appraisal reports are submitted to the Laboratory for response within 30 days. The Laboratory prepares an action plan, and then tracks corrective and improvement actions until they are closed out.

Appraisals are conducted by the program offices at DOE/HQ and involve in-depth reviews of several ES&H management and functional areas over a major part of the Laboratory. Recent comprehensive reviews have been conducted by the Secretary of Energy’s Tiger Team (1990) and by the Defense Program (1991,1992). Appraisal reports are submitted to the Laboratory for a response within 30 days. As with functional appraisals, an action plan is prepared, and corrective and improvement actions are tracked.

The Environmental, Safety and Health Office at DOE/HQ also conducts comprehensive ES&H appraisals and surveys. Recent reviews include the Environmental Management Review (1994) and the Plutonium ES&H Vulnerability Assessment (1994). The DOE Oakland Operations Office conducted an ES&H Pilot Oversight Appraisal (November 1995).

E.3. Defense Nuclear Facilities Safety Board

The Defense Nuclear Facilities Safety Board (DNFSB) was established by an Act of Congress in 1988 to provide external oversight for DOE defense nuclear facilities. Among other tasks, the DNFSB is chartered to determine if DOE safety policy and standards need improvement. In accordance with DOE guidelines, several Laboratory facilities are designated "nuclear facilities".

As part of its oversight role, staff of the DNFSB conduct periodic reviews of the Laboratory's implementation of DOE Orders, federal laws and regulations and use of standards in nuclear facilities. Such reviews include briefings by Laboratory personnel, examination of relevant policies, implementation guidance and records, and facility inspections. The DNFSB staff shares its findings with the Laboratory, but formally reports to the Board. The Board then makes it recommendations to the Secretary of Energy when it believes, based on its reviews, that safety improvements in the DOE's nuclear facilities are necessary.

E.4. Federal, State, and Local Agencies

Several federal, state and local agencies conduct inspections at both the Livermore site and at Site 300 to determine compliance with primarily environmental laws, regulations and rules, and to obtain information on current issues. Table E-1, on the following page, lists some of the inspecting agencies and the regulated area.

Regulatory agencies may issue a “notice of violation” (NOV), “a notice of deficiencies” (NOD), or “reports of violation” (ROV) and may assess fines. The Laboratory attempts to correct any deficiencies and violations either immediately or as soon as practicable.

Table E-1. Regulatory agencies and regulated areas.

Regulatory Agency	Regulated Area
California Environmental Protection Agency, Department of Toxic Substance Control (DTSC)	Hazardous Waste Permits, Resource Conservation and Recovery Act (RCRA), California Environmental Quality Act (CEQA)
California Department of Health Services (DHS)	RCRA
Alameda County Environmental Health Services (ACEHS)	California Underground Tank Regulations
San Joaquin County Public Health Services (SJCPHS)	California Underground Tank Regulations
California Department of Fish and Game	Endangered Species Act, Streambed Alteration Agreements
U.S. Fish and Wildlife Service	Endangered Species Act
California State Historic Preservation Officer	National Historic Preservation Act
San Francisco Bay Regional Water Quality Control Board (SFBRWQCB)	Clean Water Act, California Waste Discharge Requirement (WDR) Orders
Central Valley Regional Water Quality Control Board (CVRWQCB)	Clean Water Act, WDR Orders
Bay Area Air Quality Management District (BAAQMD)	Clean Air Act (Air Permits at Livermore Site)
San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD)	Clean Air Act (Air Permits at Site 300)
U.S. Environmental Protection Agency (EPA)	National Emission Standards for Hazardous Air Pollutants (NESHAPs)
Livermore Water Reclamation Plant	Sanitary Sewer Discharge Permits